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ARMY MEDICAL DEPARTMENT

REPORT

FOR THE YEAR 1868.

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VOLUME X.

Presented to both Houses of Parliament by Command of Her Majesty.

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TO THE RIGHT HONOURABLE

THE SECRETARY OF STATE FOR WAR.

SIR,

IN accordance with the instructions laid down for the conduct of business by the Director-General and Heads of Branches of the Army Medical Department, I have the honour to submit the accompanying Report on the Health of the Army in 1868, and on various matters connected with the duties of the Officers of the Department.

I have the honour to be,

SIR,

Your most obedient

Humble Servant,

T. G. LOGAN,

Director-General.

ARMY MEDICAL DEPARTMENT,
May, 1870.

TO THE DIRECTOR-GENERAL

OF THE

ARMY MEDICAL DEPARTMENT.

SIR,

We have the honour to submit the Report on the Health and Sanitary Condition of the Army for 1868. The additional aid which was temporarily granted to the Head of the Statistical Branch has enabled us to complete the volume considerably sooner than in previous years, and we trust that in future it will be ready for presentation at a still earlier date.

In this, as in the two preceding volumes, the observations by the Head of the Sanitary Branch, based upon the Reports of the different Administrative and Executive Officers, have been incorporated with the Statistical details of each Command.

The Medical History of the Abyssinian Campaign, given in the Appendix to our Report for 1867, is now supplemented by the Statistical details regarding the sickness and mortality of the European portion of the Troops employed, which will be found at page 205; the results of the efforts made to preserve the Force in health appear to have been satisfactory.

The Appendix to the present volume contains several papers of interest to the Medical Profession at large, as well as to the Officers of the Army Medical Department.

We have the honour to be,

SIR,

Your most obedient humble Servants,

T. GRAHAM BALFOUR,
Deputy Inspector-General,
Head of Statistical Branch.

H. H. MASSY,
Deputy Inspector-General,
Head of Sanitary Branch.

THOMAS CRAWFORD,
Deputy Inspector-General,
Head of Medical Branch.

WHITEHALL YARD,
May, 1870.

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ERRATA IN REPORT FOR 1867.

Page 44, second last line, *for* higher *read* lower.
„ 45, eighth line from bottom, *for* recovered *read* died.
„ 49, third „ „ „ *for* Turin *read* Tunis.
„ 99, Table, second line, fourth column, *for* 223 *read* 123.
„ 167, „ first line, fourth column, *for* 17·54 *read* 13·93.

ARMY MEDICAL DEPARTMENT REPORT FOR 1868.

I.—ON THE HEALTH OF THE TROOPS SERVING IN THE UNITED KINGDOM, IN 1868.

Section I.

Sickness and Mortality.

STATISTICAL REPORT.

United Kingdom.

THE average annual strength of Troops serving in the United Kingdom during the 53 weeks ending 1st January, 1869, as shown in the weekly returns to the Army Medical Department, was 78,261 Non-Commissioned Officers and Men. There were 70,008 admissions into hospital reported during that period, and 853 deaths, of which 69 occurred among men absent from their Corps; and the average number constantly non-effective from sickness amounted to 3,391 men. The admissions therefore were in the ratio of 894, the deaths of 10·90, and the mean daily sick of 43·33 per 1,000 of mean strength. The admissions were 24 and the deaths 1·50 per 1,000 higher than in 1867.

The following Table shows these ratios in comparison with the average of the last eight years:—

	Ratio per 1,000 of Mean Strength.		
	Admitted into Hospital.	Died.	Constantly Sick.
1868..	894	10·90	43·33
1860-67	963	9·34	49·20

The admissions and ratio constantly sick have been under the average of the preceding eight years, but the mortality has been above it.

The influence of the different classes of diseases in producing sickness and mortality is shown in the following Table:—

United Kingdom.

Orders.	Average Strength, 78,261.	Admitted into Hospital	Died.			Ratio per 1,000 of Mean Strength.			
			With the Regiment.	Absent from the Regiment.	Total.	1868.		1860–7.	
						Admitted.	Died.	Admitted.	Died.
	Class I.								
1	Miasmatic Diseases ..	13,688	68	4	72	174·9	·92	196·3	1·08
2	Enthetic „ ..	22,082	8	..	8	282·2	·10	314·1	·11
3	Dietic „ ..	859	5	2	7	11·0	·09	8·2	·07
4	Parasitic „ ..	2,462	..	..	..	31·5	..	38·7	..
	Class II.								
1	Diathetic Diseases ..	535	8	1	9	6·8	·12	3·5	·13
2	Tubercular „ ..	1,089	225	25	250	13·9	3·20	17·2	3·16
	Class III. Diseases of the—								
1	Nervous System ..	1,549	54	7	61	19·8	·78	19·1	·72
2	Circulatory „ ..	717	135	6	141	9·2	1·80	8·8	1·00
3	Respiratory „ ..	5,338	97	5	102	68·2	1·30	88·5	1·32
4	Digestive „ ..	3,041	62	7	69	38·9	·88	37·0	·54
5	Urinary „ ..	203	22	1	23	2·6	·29	3·0	·16
6	Reproductive „ ..	931	..	..	..	11·9	..	10·2	..
7	Locomotive „ ..	376	1	..	1	4·8	·01	4·1	·02
8	Integumentary „ ..	9,894	..	..	..	120·0	..	125·4	·05
	Class IV.								
4	Diseases of Nutrition..	316	1	..	1	4·0	·01	2·2	·03
	Class V.								
1	Accidents	7,356	67	7	74	94·0	·95	84·0	·61
3	Homicide	..	1	..	1	..	·01	} ·2 {	·02
4	Suicide	12	30	4	34	·1	·44		·30
5	Execution	..	..	..	..	..	..	..	·01
6	Corporal Punishment..	9	..	..	..	·1	..	1·8	..
	No Appreciable Disease	51	..	..	..	·6	..	1·1	..
	Cause unknown ..	..	..	..	..	..	..	..	·01
	Total ..	70,008	784	69	853	894·5	10·90	963·4	9·34

The admissions into hospital have been 69 per 1,000 below and the deaths 1·56 per 1,000 above the average of the preceding eight years. The reduction in the former has taken place chiefly in miasmatic and enthetic diseases, and in those of the respiratory system. The increase in the deaths has not been confined to any class, but has been most marked in diseases of the circulatory system, in those of the digestive system, and in accidents. There has been a trifling decrease in the mortality by miasmatic diseases.

The following Table shows the admissions and deaths at the different groups of stations, arranged as in previous reports:—

United Kingdom.

	Average Strength.	Admitted into Hospital.	Died.	Average constantly Sick.
1. Seaport Towns	10,415	11,093	119	522
2. Dockyards and Arsenals	10,736	9,691	111	430
3. Camps	18,427	16,485	164	797
4. Large Manufacturing Towns ..	3,209	3,225	49	149
5. London and Windsor	5,406	4,254	27	250
6. Dublin	4,899	4,446	63	242
7. Stations of Depôt Battalions not included in preceding groups ..	7,116	7,060	82	354
8. Remaining Stations	18,053	13,754	169	617
9. Detached from their Corps ..	..	..	69	..
Total ..	78,261	70,008	853	3,391

The ratio per 1,000 of mean strength calculated from these numbers, with similar information for the preceding eight years, is shown in the following Table :—

	Ratio per 1,000 of Strength.					
	1868.			1860–67.		
	Admitted into Hospital.	Died.	Constantly Sick.	Admitted into Hospital.	Died.	Constantly Sick.
1. Seaport Towns	1,065	11·42	50·12	1,000	9·20	53·40
2. Dockyards and Arsenals ..	903	10·33	42·84	1,068	9·52	54·53
3. Camps	895	8·90	43·25	915	6·64	47·98
4. Large Manufacturing Towns	1,005	15·27	46·43	1,043	8·69	48·81
5. London and Windsor	787	4·99	46·24	871	7·85	50·44
6. Dublin	907	12·86	49·39	943	8·84	53·10
7. Stations of Depôt Battalions not included in preceding groups	992	11·52	49·74	1,040	8·82	50·54
8. Remaining Stations ..	762	9·36	34·17	868	7·47	38·61
Total, including men detached from their Corps	894	10·90	43·33	963	9·35	49·20

The admissions have been considerably lower than in 1867 at the Stations of Depôt Battalions, and higher at the Seaport Towns, Dockyards and Arsenals, and Dublin. At the other stations the difference has been unimportant. At all of the groups except the Seaport Towns they have been under the average of the preceding eight years. The mortality has been higher than in 1867, and also above the average of the eight years at all the groups except London and Windsor, where the ratio has been extremely low.

The mean daily sick shows an increase upon the amount in 1867 at London and Windsor, Dublin, and the Depôt Battalion Stations, but in all the groups the proportion was under the average of the previous eight years.

The influence of the different classes of diseases on the sickness and mortality at each group of stations is shown in the following Table :—

Orders.	Groups of Stations	Seaports.		Dockyards and Arsenals.		Camps.		Manufacturing Towns.		London and Windsor.		Dublin.		Depôt Battalions.		Remaining Stations.		Men detached from their Corps.	
	Average Strength	10,415		10,736		18,427		3,209		5,406		4,899		7,116		18,053			
	Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
	Class I.																		
1	Miasmatic Diseases	2,175	12	2,416	4	3,090	15	487	2	804	2	929	12	1,320	4	2,467	17	..	4
2	Enthetic „	3,480	2	2,388	2	5,148	2	1,161	..	1,601	..	1,630	..	2,278	..	4,396	2	..	..
3	Dietic „	145	1	106	..	205	1	70	..	45	..	26	..	99	2	163	1	..	2
4	Parasitic „	384	..	416	..	703	..	108	..	106	..	79	..	222	..	444	..	..	..
	Class II.																		
1	Diathetic Diseases	78	..	95	..	131	2	16	1	31	1	34	1	57	2	93	1	..	1
2	Tubercular „	147	28	154	43	245	41	70	19	55	8	67	18	121	26	230	42	..	25
	Class III. Diseases of the—																		
1	Nervous System	265	7	250	7	356	17	47	4	71	..	106	3	174	7	280	9	..	7
2	Circulatory „	135	17	90	15	179	34	32	7	28	5	24	6	88	20	131	31	..	6
3	Respiratory „	901	21	836	13	1,150	22	292	5	325	2	391	9	444	9	999	16	..	5
4	Digestive „	514	9	528	11	602	9	147	3	226	5	150	6	321	8	563	11	..	7
5	Urinary „	28	3	23	5	50	5	16	3	5	1	18	1	23	2	40	2	..	1
6	Reproductive „	145	..	103	..	246	..	38	..	56	..	66	..	81	..	196	..	..	..
7	Locomotive „	68	..	62	..	105	..	11	..	14	..	29	..	38	..	49	1	..	..
8	Integumentary „	1,434	..	1,160	..	2,438	..	405	..	486	..	554	..	989	..	1,928	..	..	..
	Class IV.																		
4	Diseases of Nutrition	54	..	52	..	61	1	17	..	5	..	15	..	51	..	61	..	..	..
	Class V.																		
1	Accidents	1,129	11	999	5	1,761	11	300	2	393	2	326	4	747	2	1,701	30	..	7
3	Homicide	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
4	Suicide	2	8	1	6	5	4	..	3	..	1	1	3	1	..	2	5	..	4
6	Corporal Punishment	..	..	..	..	5	..	..	..	1	..	..	..	1	..	2	..	..	..
	No appreciable disease	9	..	12	..	5	..	8	..	2	..	1	..	5	..	9	..	..	..
	Total	11,093	119	9,691	111	16,485	164	3,225	49	4,254	27	4,446	63	7,060	82	13,754	169	..	69

RATIO per 1,000 of MEAN STRENGTH.

Orders.	Groups of Stations ..	Seaports.		Dockyards and Arsenals.		Camps.		Manufacturing Towns.		London and Windsor.		Dublin.		Depôt Battalions.		Remaining Stations.	
	Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
	Class I.																
1	Miasmatic Diseases ..	208·8	1·15	225·0	·37	167·7	·82	151·8	·62	148·7	·37	189·6	2·45	185·5	·56	136·7	·94
2	Enthetic „ ..	334·1	·19	222·4	·19	279·4	·11	361·8	..	296·2	..	332·7	..	320·1	..	243·5	·11
3	Dietic „ ..	13·9	·10	9·9	..	11·1	·05	21·8	..	8·3	..	5·3	..	13·9	·28	9·0	·06
4	Parasitic „ ..	36·9	..	38·7	..	38·1	..	63·7	..	19·6	..	16·1	..	31·2	..	24·6	..
	Class II.																
1	Diathetic Diseases ..	7·5	..	8·9	..	7·1	·11	5·0	·31	5·7	·18	6·9	·20	8·0	·28	5·2	·06
2	Tubercular „ ..	14·1	2·69	14·3	4·00	13·3	2·22	21·8	5·92	10·2	1·48	13·7	3·67	17·0	3·65	12·7	2·33
	Class III.																
	Diseases of the—																
1	Nervous System ..	25·4	·67	23·3	·65	19·3	·92	14·6	1·24	13·1	..	21·6	·61	24·5	·99	15·5	·50
2	Circulatory „ ..	13·0	1·63	8·4	1·40	9·7	1·85	10·0	2·18	5·2	·93	4·9	1·23	12·4	2·81	7·3	1·71
3	Respiratory „ ..	86·5	2·01	77·9	1·21	62·4	1·19	91·0	1·56	60·1	·37	79·8	1·84	62·4	1·26	55·3	·88
4	Digestive „ ..	49·4	·86	49·2	1·02	32·7	·49	45·8	·94	41·8	·93	30·6	1·23	45·1	1·13	31·2	·61
5	Urinary „ ..	2·7	·29	2·1	·47	2·7	·27	5·0	·94	·9	·18	3·7	·20	3·2	·28	2·2	·11
6	Reproductive „ ..	13·9	..	9·6	..	13·3	..	11·8	..	10·4	..	13·5	..	11·4	..	10·9	..
7	Locomotive „ ..	6·5	..	5·8	..	5·7	..	3·4	..	2·6	..	5·9	..	5·3	..	2·7	·06
8	Integumentary „ ..	137·7	..	108·0	..	132·3	..	126·2	..	89·9	..	113·1	..	139·0	..	106·8	..
	Class IV.																
4	Diseases of Nutrition ..	5·2	..	4·8	..	3·3	·05	5·3	..	·9	..	3·1	..	7·2	..	3·4	..
	Class V.																
1	Accidents	108·4	1·06	93·1	·47	95·6	·60	93·5	·62	72·7	·37	66·6	·82	105·0	·28	94·2	1·66
3	Homicide	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·06
4	Suicide	·2	·77	·1	·55	·3	·22	..	·94	..	·18	·2	·61	·1	..	·1	·27
6	Corporal Punishment ..	..	..	..	..	·3	..	..	..	·2	..	..	..	·1	..	·1	..
	No appreciable disease	·8	..	1·1	..	·3	..	2·5	..	·4	..	·2	..	·7	..	·5	..
	Total	1065·0	11·42	902·6	10·33	894·6	8·90	1005·0	15·27	786·9	4·99	907·5	12·86	902·1	11·52	761·9	9·36

United Kingdom.

MIASMATIC DISEASES were more prevalent than in 1867 at all the groups of stations except those of Dépôt Battalions and the "Remaining Stations," but the ratio of deaths was lower than in that year at all, except the Seaports and Manufacturing Towns; when subdivided, the following results are obtained:—

		Annual Ratio per 1,000 of Mean Strength.							
		Seaport Towns.	Dockyards and Arsenals.	Camps.	Manufacturing Towns.	London and Windsor.	Dublin.	Depôt Battalion Stations.	Remaining Stations.
Eruptive Fevers ..	Admitted	4·3	6·1	4·4	6·9	2·6	3·7	5·3	1·6
	Died ..	..	·09	·10	·31	·18	..	..	..
Paroxysmal Fevers ..	Admitted	25·6	29·5	5·7	5·3	·6	3·9	16·3	5·7
	Died ..	..	..	..	..	..	..	..	..
Continued Fevers ..	Admitted	23·1	12·9	15·8	19·3	14·2	29·6	11·5	13·0
	Died ..	·77	·09	·48	·31	..	2·24	..	·66
Dysentery & Diarrhœa	Admitted	24·9	21·2	15·2	22·1	16·6	16·1	20·4	12·1
	Died ..	·29	..	..	..	..	..	·28	·06
Spasmodic Cholera	Admitted	·1	..	·1	..	..	..	..	..
	Died ..	..	..	·06	..	..	..	..	..
Sorethroat and Influenza	Admitted	38·5	74·6	54·6	42·4	49·9	58·6	57·2	36·0
	Died ..	..	·09	·06	..	..	..	..	..
Ophthalmia	Admitted	21·1	10·8	18·3	13·1	8·5	20·2	16·3	14·3
	Died ..	..	..	..	..	..	..	..	..
Rheumatism	Admitted	54·4	55·4	42·1	33·3	42·6	44·1	45·4	38·9
	Died ..	..	..	·06	..	·18	·20	·28	·11

Eruptive Fevers have been more prevalent than in 1867 at all the groups of stations except London and Windsor, and the "Remaining Stations." At the Seaports the increase was chiefly by measles and scarlet fever at Portsmouth; at the Dockyards and Arsenals, by small-pox at Woolwich, and measles and scarlet fever at Chatham; at the Camps, by measles and scarlet fever at Aldershot, and measles at Colchester; in the Manufacturing Towns, by small-pox at Sheffield; at Dublin by measles; and at the Depôt Battalion Stations, by measles at Warley and at Fort George in a detachment of the Depôt Battalion from Aberdeen. None of these diseases, however, assumed the form of a severe epidemic. Only two cases of small-pox terminated fatally, one at Colchester and the other at Sheffield; and three of scarlet fever, one at Woolwich, one at Aldershot, and one in London.

Paroxysmal Fevers were much higher than in the preceding year at the Seaports, the Dockyards and Arsenals, and the Depôt Battalion Stations. In the first of these groups the excess occurred chiefly at Portsmouth and Dover; and in the second at Woolwich and Chatham, among men of corps which returned from service in India and Abyssinia. The excess in the Depôt Battalion was chiefly in the 1st and 2nd at Chatham, and the 6th at Walmer. In the "Remaining Stations" Weymouth furnished a high proportion, from the frequency of cases among the men of the 13th Regiment, which returned in the middle of 1867 from the Mauritius, where it had suffered so much from the epidemic malarious fever. In all these instances the disease was manifestly the result of previous tropical service.

Continued Fevers show an increase upon the ratio for 1867, at the Seaports, Camps, Manufacturing Towns, and Dublin, and the mortality at the latter station, though slightly lower than in that year, was thrice as high as at any other group of stations. At the Seaports, Portsmouth furnished the greatest proportion of admissions and deaths; at the Camps the proportion of cases did not differ materially except at Colchester, where it amounted only

to half that of the other Camps; and in the Manufacturing Towns, the excess of cases was due to Sheffield and Belfast. The high rate of mortality in Dublin was caused by the occurrence of several cases of that peculiar form of fever alluded to in our last Report as having been returned under the various names of purpuric fever, malignant typhus, and cerebro-spinal meningitis. In 1868 there were six cases reported from Dublin, and five of them proved fatal. *United Kingdom.*

Dysentery and Diarrhœa were less prevalent than in the preceding year at the Camps, London and Windsor, and the "Remaining Stations," but more prevalent at the other groups. At none, however, did they prevail to any great extent. There were only five deaths by them, and three of these were caused by chronic dysentery, probably the result of previous tropical service.

Spasmodic Cholera did not prevail as an epidemic during the year. Two well-marked sporadic cases are reported to have occurred, one at Portsmouth and the other at Aldershot, the latter proved fatal.

Sorethroat (Tonsillitis) *and Influenza.*—The admissions by these diseases were above the average in the Dockyards and Arsenals, particularly Plymouth, and in the Camps and at Dublin, but there was no such unusual prevalence as to call for special remark.

ENTHETIC DISEASES, although under the average, were only 10 per 1,000 of the strength below the proportion in 1867. The decrease was more or less manifest at all the groups of stations except Dublin, where the ratio was identical in the two years, and London and Windsor and the "Remaining Stations," at which there was an increase.

The following Table shows their prevalence at all the large stations during the last two years:—

	Ratio per 1,000 of Mean Strength.			Ratio per 1,000 of Mean Strength.	
	1868.	1867.		1868.	1867.
Colchester	537	500	Devonport and Plymouth	280	312
Canterbury	407	375			
Preston	379	361	Chatham and Sheerness	275	277
Dover	376	354	Curragh	243	280
Winchester	349	288	Aldershot	237	261
Portsmouth and Gosport	348	378	Cork	209	196
Isle of Wight	346	327	Woolwich	191	255
Warley	330	328	Fermoy	186	202
Dublin	333	333	Pembroke Dock ..	159	153
Belfast	329	230	Edinburgh	157	244
Manchester	312	501	London and Windsor (Household Cavalry .. / Foot Guards)	133 / 343	129 / 326
Shorncliffe	291	215			
Limerick	291	272			

This Table shows a very marked reduction in the admissions by this class of diseases during the year at Manchester, Edinburgh, and Woolwich; a moderate reduction at Devonport, Portsmouth, Aldershot, and Fermoy; scarcely any difference in the proportion at Warley, Chatham and Sheerness, Pembroke Dock, Dublin, and among the Household Cavalry. At all the other stations there was an increase, but it was most marked at Belfast, Shorncliffe, and Winchester. At five of the stations the Contagious Diseases Act was in operation during the whole year, and at four of these,—Woolwich, Devonport and Plymouth, Portsmouth and Gosport, and Aldershot,—there was a reduction in the amount of venereal diseases. At the other, Chatham and Sheerness, there was scarcely an appreciable difference. The Act was applied to Colchester and Windsor during the year, but had not been sufficiently long in operation to have effected any improvement.*

* As the influence of the Contagious Diseases Act is exciting considerable interest, a memorandum and tables by the head of the Statistical Branch have been reprinted at p. 255 of this volume, from the Report of the Select Committee of the House of Commons.

United Kingdom.

TUBERCULAR DISEASES.—The ratio of admissions by these diseases was higher than in 1867 at the Manufacturing Towns and Depôt Battalion Stations, but there was not a proportionate increase in the mortality. At the other groups of stations the admissions and deaths by this class did not vary from the preceding year sufficiently to require comment, except at London and Windsor, where the reduction in the former amounted to rather more than one-third, and in the latter to more than half the proportion in 1867. We shall notice this more particularly in connection with the sickness and mortality of the different arms of the Service.

DISEASES OF THE RESPIRATORY SYSTEM were less prevalent than in 1867 at all the groups of stations except the Seaports and Dockyards and Arsenals. The reduction was most marked in the Manufacturing Towns, but they still yielded the highest ratio.

DISEASES OF THE DIGESTIVE SYSTEM were more prevalent than in the preceding year at all the groups of stations except the Camps, where the proportions in the two years was the same, and Dublin, where there was a reduction amounting to one-fourth. Dyspepsia was the chief cause of admissions in this class, and next to it hepatic inflammation and jaundice. Nearly two-thirds of the deaths by this class of diseases were the result of affections of the liver, in a large proportion of cases the result of previous tropical service.

ACCIDENTAL AND VIOLENT DEATHS were considerably above the average at all the groups, except London and Windsor and the Depôt Battalion Stations. Of 74 accidental deaths 31 were caused by drowning, and 22 of these occurred at the group of "Remaining Stations."

Having thus examined the details respecting the sickness and mortality among the troops serving at the different groups of stations in the United Kingdom, we shall now proceed to submit the usual information respecting the health of the different arms of the Service.

The admissions into hospital, deaths, and discharges by invaliding, in each arm of the Service, are shown in the following Table, those Corps only being included which were stationed in the United Kingdom during the whole year:—

	Average Strength.	Admitted into Hospital.	Died in and out of Hospital.	Discharged as Invalids.	Annual Ratio per 1,000 of Strength.			1859-67. Annual Ratio per 1,000.		1860-7 Ratio per 1,000.
					Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.
Household Cavalry	1,212	767	12	24	633	9·88	19·78	608	7·48	14·67
Dragoon Guards & Dragoons ..	8,281	6,337	65	205	765	7·84	24·75	897	6·44	29·93
Royal Artillery ..	9,565	8,558	117	178	895	12·23	18·61	999	7·45	*
Royal Engineers..	2,798	..	15	26	..	5·36	9·29	..	6·76	7·99
Military Train ..	1,509	1,184	19	23	785	12·59	15·24	1,007	6·56	24·28
Foot Guards ..	5,678	4,170	29	101	734	5·10	17·78	827	8·41	29·18
Infantry Regts. ..	25,208	20,369	201	590	808	7·97	23·40	832	7·95	29·18
Army Hosp. Corps	690	..	10	5	..	14·49	7·25	..	15·78	2·86
Commist. Staff „	412	..	4	2	..	9·71	4·85	..	13·15	21·05
Depôt Brig., R.A..	2,711	2,667	24	38	984	8·85	14·02	1,111	10·48	*26·15
Coast Brig., R.A..	1,737	..	30	12	..	17·27	6·91	..	18·34	8·90
Depôt Battalions.	14,186	13,833	197	312	975	13·81	21·99	993	11·59	41·15

Compared with the results for 1867 there has been a decrease in the admis-

* Prior to 1864 it was found impossible to separate the invalids of the Brigades serving at home from those of the Depôt Brigades. The ratio discharged as invalids in 1868, calculated in the same manner as for the preceding years, would be 17·60 per 1,000 of the strength.

sions of the Military Train, Foot Guards, and Depôt Brigade Royal Artillery; in the deaths of the Foot Guards, Infantry Regiments, Army Hospital Corps, Commissariat Staff Corps, and Depôt Brigade Royal Artillery; and an increase in all the other arms. There has been an increase in the discharges by invaliding from the Household Cavalry, Royal Engineers, Military Train, and Depôt Brigade Royal Artillery, the proportion from the Coast Brigade remains unchanged, and there has been a decrease for all the other arms. *United Kingdom.*

The admissions have been below the average of the preceding nine years in all the arms except the Household Cavalry, but the deaths have been above it in the Household Cavalry, and Cavalry of the Line, Royal Artillery, and Military Train. In the Infantry Regiments they have been exactly the average, and in the other arms they have been under it.

By a Return obtained from the War Office, it appears that from the Corps included in the preceding Table there were 2,086 men placed on the Pension List during the year, and 73 of these died before the 31st December. When one-half of the numbers so pensioned is added to the strength and the deaths are included in the mortality, the following results are obtained:—

	1868.			1860–67.
	Average Strength corrected as above.	Deaths of Soldiers and Pensioners.	Ratio of Deaths per 1,000 of Strength.	Ratio of Deaths of Soldiers and Pensioners per 1,000 of Strength.
Household Cavalry	1,241	17	13·70	8·87
Cavalry of the Line	8,422	70	8·31	7·58
Royal Artillery	9,791	135	13·79	8·15
Military Train	1,521	20	13·15	7·24
Foot Guards	5,753	41	7·13	10·98
Infantry Regiments	25,769	233	9·04	9·31

The mortality of the soldiers and pensioners combined was above the average of the preceding eight years in all the arms except the Foot Guards and Infantry; in the former there was a very marked and in the latter a slight reduction from the average. In 1868 the highest ratio of deaths was in the Royal Artillery and Household Cavalry, and the lowest in the Foot Guards; while on the average of eight years it had been highest in the Foot Guards, and lowest in the Military Train and Cavalry of the Line. It must not be forgotten that the deaths of the men after discharge are of those only who established a claim to pension, and include all such, whether the cause of discharge was disability or length of service. No information can be obtained regarding any casualties which occur among men discharged without being placed on the Pension List.

The influence of the different classes of diseases in causing sickness and mortality in each arm of the Service is shown in the following Table. The details for 1868 will be found in Abstract No. 1 in the Appendix:—

Orders.	Diseases.	Household Cavalry.			Cavalry.			Royal Artillery.			Military Train.			Foot Guards.			Infantry Regiments.			Depôt Brigade Royal Artillery.			Infantry Depôt Battalions.			Royal Engineers.		Coast Brigade, R. A.		Army Hospital Corps.		Commissariat Staff Corps.	
	Strength	1,212			8,281			9,565			1,509			5,678			25,208			2,711			14,186			2,798		1,737		690		412	
		Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Died.	Invalided.	Died.	Invalided.	Died.	Invalided.	Died.	Invalided.
	Class I.																																
1	Miasmatic Diseases ..	171	1	1	1,157	10	25	1,675	5	6	252	2	4	787	4	5	3,957	20	71	674	1	4	2,502	14	22	1	1	..	1	1	..	..	..
2	Enthetic ,, ..	168	..	1	1,945	1	10	2,328	4	14	337	..	1	1,738	..	7	6,279	..	45	761	1	1	4,592	1	18	..	2	..	..	..	..	..	..
3	Dietic ,, ..	1	..	..	52	..	..	117	1	..	6	..	..	47	1	1	255	2	1	15	..	..	179	2	..	..	..	..	..	..	..	..	..
4	Parasitic ,, ..	6	..	..	175	..	..	218	..	..	21	..	..	115	..	..	836	..	..	80	..	..	709	..	..	..	..	..	..	..	..	..	..
	Class II.																																
1	Diathetic Diseases ..	11	..	..	59	..	1	56	..	3	23	..	2	24	1	..	147	2	6	29	..	..	96	3	..	..	..	2	..	..	1	..	..
2	Tubercular ,, ..	11	6	11	76	15	31	102	35	36	17	1	5	60	7	43	329	52	118	33	12	3	273	69	68	4	9	8	3	6	2	3	..
	Class III. Diseases of the—																																
1	Nervous System ..	11	1	4	131	6	26	215	6	31	28	3	2	73	3	15	450	17	92	63	1	9	340	17	63	..	4	3	2	..	..	..	..
2	Circulatory ,, ..	7	..	2	44	10	36	107	25	24	13	4	1	25	8	13	214	34	91	10	1	1	190	34	44	5	2	4	2	1	2	..	1
3	Respiratory ,, ..	83	1	2	358	12	8	707	11	8	102	2	4	275	2	5	1,675	20	38	200	1	3	963	26	17	2	1	2	1	1	1	..	..
4	Digestive ,, ..	63	..	1	220	2	26	432	5	18	39	2	3	182	3	..	846	18	35	120	4	5	633	14	32	2	1	4	1	1	..	1	..
5	Urinary ,, ..	1	1	..	17	2	1	27	2	2	2	3	..	5	..	2	67	5	6	8	1	1	43	6	6	1	2	1	..	..	..	..	..
6	Reproductive ,, ..	13	..	..	114	..	3	127	..	1	21	..	..	49	..	..	273	..	6	19	..	1	171	..	3	..	1	..	..	..	..	..	..
7	Locomotive ,, ..	2	..	..	23	..	8	43	..	2	7	..	..	21	..	4	127	..	26	8	..	2	81	1	13	..	2	..	..	..	..	..	..
8	Integumentary ,, ..	108	..	1	1,093	..	18	1,247	..	3	181	..	..	436	..	3	2,682	..	15	335	..	2	1,835	..	9	..	..	..	..	..	..	..	..
	Class IV.																																
4	Diseases of Nutrition.	..	..	..	8	..	4	54	..	11	6	..	..	5	..	1	123	1	19	20	..	4	77	..	8	..	1	..	..	..	..	..	..
	Class V.																																
1	Accidents	110	2	1	864	4	6	1,095	16	16	129	2	1	326	..	2	2,087	21	16	291	1	2	1,131	4	9	..	..	4	2	2	..	..	..
2	Battle	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	Homicide	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	Suicide	..	..	..	..	3	..	1	7	..	..	..	..	..	..	..	6	4	3	..	1	..	2	3	..	..	..	2	..	..	..	..	..
5	Corporal Punishment.	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	5	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
	No appreciable disease	1	..	..	1	..	..	6	..	..	..	..	..	1	..	..	10	..	..	1	..	..	15	..	..	..	..	..	..	..	..	..	..	..
	Diseases not specified.	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total	767	12	24	6,337	65	205	8,558	117	178	1,194	19	23	4,170	29	101	20,369	201	590	2,667	24	38	13,833	196	312	15	26	30	12	10	6	4	2

Ratio per 1,000 of Mean Strength.

Order.	Diseases.	Household Cavalry.			Cavalry.			Royal Artillery.			Military Train.			Foot Guards.			Infantry Regiments.			Depôt Brigade Royal Artillery.			Infantry. Depôt Battalions.			Royal Engineers.		Coast Brigade, R.A.		Army Hospital Corps.		Commissariat Staff Corps	
	Strength	1,212			8,284			9,565			1,509			5,678			25,208			2,711			14,186			2,798		1,737		690		412	
		Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Died.	Invalided.	Died.	Invalided.	Died.	Invalided.	Died.	Invalided.
	Class I.																															
1	Miasmatic Diseases..	141·0	·82	·82	139·7	1·21	3·02	175·1	·52	·63	167·0	1·33	2·65	138·6	·70	·88	157·0	·79	2·82	248·6	·37	1·47	176·4	·99	1·55	·36	·36	..	·58	1·45	..	..	..
2	Enthetic „ ..	138·6	..	·82	234·9	·12	1·21	243·4	·42	1·46	223·3	...	·66	308·1	..	1·23	249·1	..	1·78	280·7	·37	·37	323·7	·07	1·27	..	·71	..	..	..	..	..	..
3	Dietic „ ..	·8	..	..	6·3	..	..	12·2	·11	..	4·0	..	..	8·3	·18	·18	10·1	·08	·04	5·5	..	..	12·6	·14	..	..	..	..	..	..	..	..	..
4	Parasitic „ ..	5·0	..	..	21·1	..	..	22·8	..	..	13·9	..	..	20·2	..	..	33·2	..	..	29·5	..	..	50·0	..	..	..	..	..	..	..	..	..	..
	Class II.																															
1	Diathetic Diseases ..	9·1	..	..	7·1	..	·12	5·8	..	·31	15·2	..	1·33	4·2	·18	..	5·8	·08	·24	10·7	..	..	6·8	·21	..	..	..	1·15	..	..	1·45	..	..
2	Tubercular „ ..	9·1	4·95	9·08	9·2	1·81	3·74	10·7	3·66	3·76	11·3	·66	3·31	10·6	1·23	7·57	13·0	2·06	4·68	12·2	4·42	1·11	19·2	4·86	4·79	1·43	3·22	4·61	1·72	8·69	2·90	7·23	..
	Class III. Diseases of the—																															
1	Nervous System ..	9·1	·82	3·30	15·8	·72	3·14	22·5	·63	3·76	18·6	1·98	1·33	12·9	·53	2·64	17·9	·68	3·65	23·2	·37	3·32	24·0	1·20	4·44	..	1·43	1·73	1·15	..	..	..	..
2	Circulatory „ ..	5·8	..	1·65	5·3	1·21	4·34	11·2	2·01	2·51	8·6	2·65	·66	4·4	1·40	2·29	8·5	1·35	3·61	3·7	·37	·37	13·4	2·40	3·10	1·79	·71	2·30	1·15	1·45	2·90	..	2·43
3	Respiratory „ ..	68·5	·82	1·65	48·2	1·45	·97	73·9	1·15	·84	67·6	1·33	2·65	48·4	·35	·88	66·4	·79	1·51	73·8	·37	1·11	67·9	1·83	1·20	·71	·36	1·15	·58	1·45	1·45	..	..
4	Digestive „ ..	52·0	..	·82	26·6	·24	3·14	45·2	·52	1·88	25·8	1·33	1·99	32·0	·53	..	33·6	·71	1·39	44·3	1·47	1·84	44·6	·99	2·25	·71	·36	2·30	·58	1·45	..	2·43	..
5	Urinary „ ..	·8	·82	..	2·0	·24	·12	2·8	·21	·21	1·3	1·98	..	·9	..	·35	2·6	·20	·24	2·9	·37	·37	3·0	·42	·42	·36	·71	·58	..	..	..	..	..
6	Reproductive „ ..	10·7	..	..	13·8	..	·36	13·3	..	·11	13·9	..	..	8·6	..	..	10·9	..	·24	7·0	..	·37	12·0	..	·21	..	·36	..	..	..	..	..	2·43
7	Locomotive „ ..	1·6	..	..	2·8	..	·97	4·5	..	·21	4·6	..	..	3·7	..	·70	5·0	..	1·03	2·9	..	·74	5·7	·07	·92	..	·71	..	..	..	..	..	..
8	Integumentary „ ..	89·1	..	·82	132·0	..	2·17	130·4	..	·31	120·0	..	..	76·8	..	·53	106·4	..	·59	123·6	..	·74	129·3	..	·64	..	..	..	..	..	..	..	..
	Class IV.																															
4	Diseases of Nutrition	..	..	..	1·0	..	·48	5·6	..	1·15	4·0	..	..	·9	..	·18	4·9	·04	·75	7·4	..	1·47	5·4	..	·56	..	·36	..	..	..	..	..	..
	Class V.																															
1	Accidents	90·8	1·65	·82	104·3	·48	·97	114·5	1·67	1·67	85·5	1·33	·66	57·4	..	·35	82·8	·83	·63	107·3	·37	·74	79·7	·28	·64	..	..	2·30	1·15	..	..	..	..
2	Battle	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·08	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	Homicide	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	·20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	Suicide	..	..	..	..	·36	..	1	·73	..	..	..	..	..	..	..		1·16	·12	..	..	..	2	·35	..	..	..	1·15	..	..	..	..	..
5	Corporal Punishment	..	..	..	..	..	..	1	..	..	..	..	..	2	..	..	2	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
	No appreciable disease	·8	..	..	1	..	..	·6	..	..	..	..	..	2	..	..	4	..	..	4	..	..	1·1	..	..	..	..	..	..	..	..	..	..
	Diseases not specified	..	..	..	..	..	..	..	..	31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total	632·8	9·88	19·78	765·2	7·84	24·75	894·7	12·23	18·60	784·6	12·59	15·24	734·4	5·10	17·78	808·0	7·97	23·40	983·7	8·85	14·02	975·1	13·81	21·99	5·36	9·29	17·27	6·91	14·49	8·70	9·71	4·86

United Kingdom.

United Kingdom. MIASMATIC DISEASES gave rise to a higher proportion of admissions than in 1867 in all the arms of the Service except the Depôt Brigade Royal Artillery, in which, however, although there was a reduction compared with that year, the ratio was still higher than in any other arm. When subdivided into groups these diseases give the following results :—

		Annual Ratio per 1,000 of Mean Strength.							
		Household Cavalry.	Dragoon Guards and Dragoons.	Royal Artillery.	Military Train.	Foot Guards.	Infantry Regiments.	Depôt Brigade, Royal Artillery.	Depôt Battalions.
Eruptive Fevers	Admitted ..	4·9	2·7	3·6	5·3	1·8	2·6	7·4	7·1
	Died	·82	..	..	·66	..	·04	..	·14
Paroxysmal Fevers ..	Admitted ..	2·5	4·5	10·1	·7	..	5·7	24·7	18·4
	Died	..	..	..	..	..	..	..	..
Continued Fevers ..	Admitted ..	4·1	10·0	13·2	11·9	23·8	19·8	10·3	15·8
	Died	..	1·21	·10	·66	·53	·55	..	·56
Dysentery and Diarrhœa ..	Admitted ..	16·5	10·5	23·3	11·3	15·9	14·5	22·1	19·5
	Died	..	..	·31	..	..	..	..	·21
Sorethroat and Influenza ..	Admitted ..	24·7	45·0	50·1	68·3	47·0	44·4	97·4	45·4
	Died	..	..	·10	..	..	·04	..	..
Ophthalmia ..	Admitted ..	5·8	9·4	12·0	9·9	7·9	19·8	11·8	15·7
	Died	..	..	..	..	..	..	..	..
Rheumatism ..	Admitted ..	53·6	39·5	46·4	46·4	33·8	39·9	64·2	40·9
	Died	..	..	..	..	·18	·08	·37	·07

Eruptive Fevers were considerably above the average in the Military Train the Depôt Brigade Royal Artillery, and the Depôt Battalions. In the two first the excess arose chiefly from the occurrence of a number of cases of small-pox at Woolwich, where the disease prevailed during the first half of the year to a considerable extent among the civil population ; there were 5 cases in the Military Train and 20 in the Artillery at that station, all of which recovered. In the Depôt Battalions, small-pox was unusually prevalent in the 14th Depôt Battalion at Sheffield, where it was epidemic among the civil population ; and measles gave rise to 8 admissions in the 2nd Battalion at Chatham, 9 each in the 4th and 8th at Colchester, 9 in the 11th at Gosport, and the same number in the 15th at Aberdeen ; all of the cases terminated in recovery.

Paroxysmal Fevers were above the average in the Royal Artillery, chiefly the 11th, 12th, 13th, and 17th Brigades and in the 1st and 2nd Divisions of the Depôt Brigade ; they were also prevalent in the 2nd, 3rd, and 6th Depôt Battalions. In all these Corps the liability to intermittent fever was due to the previous service of the men in malarious countries. There was not a single death recorded under this group of fevers.

Continued Fevers were more prevalent than in 1867 in the Foot Guards and Infantry Regiments. In the former the excess occurred in the Grenadier Guards ; more than half the cases in it were furnished by the 3rd Battalion, when quartered in Beggars Bush Barracks, Dublin ; and a large proportion of the remainder by the 1st Battalion in London. The Infantry Regiments which had the largest number of cases were the 66th in the Channel Islands, and afterwards in Dublin, the 67th at the Curragh, and subsequently Portsmouth, and the 81st at Cork and Buttevant, with numerous detachments.

Dysentery and Diarrhœa did not show any marked difference from the results of the preceding year, except in the Artillery and Depôt Battalions, in both of which there was a considerable increase. Of the latter the 9th Batta-

lion at Preston, the 13th at Pembroke Dock, and the 14th at Sheffield, furnished the highest proportion of cases. The 11th Brigade had the greatest amount of diarrhœa in the Artillery. *United Kingdom.*

Sorethroat and Influenza were more prevalent than in 1867 in the Cavalry of the Line, chiefly the 6th Dragoon Guards; in the Royal Artillery, the 11th Brigade furnishing the greatest number of cases; in the Military Train at Aldershot and Woolwich, and in the Infantry Regiments, particularly the 51st and 2nd Battalion Rifle Brigade. The Depôt Brigade Royal Artillery, had the highest proportion of admissions, though lower than in the preceding year; the great excess occurred in the 2nd Division at Woolwich and in the 3rd at Warley.

Ophthalmia was in a very slight degree more prevalent than in 1867 in all the arms; the Infantry Regiments, as in that year, furnished the highest proportion of cases; the greatest number of admissions in any Corps amounted to 54, and occurred in the 2nd Battalion 3rd Regiment, chiefly in a detachment quartered in the Raglan Barracks, Devonport; it is stated that many of the men had suffered from this disease during their previous service in the Mediterranean and West Indies.

Enthetic Diseases.—Compared with the results of the preceding year there has been an increase in the prevalence of these diseases in the Cavalry, Household and Line, and in the Depôt Battalions, and a decrease in all the other arms except the Foot Guards, in which the proportion in the two years is almost exactly the same. The reduction has been most marked in the Military Train and the Depôt Brigade R.A. The highest ratio of admissions occurred in the Depôt Battalions, those most affected being the 4th and 8th at Colchester, the 11th at Gosport, and the 14th at Sheffield. The ratio was also very high in the Foot Guards, and chiefly in the 3rd Battalion Grenadier and the two Battalions of Coldstream Guards.

Tubercular Diseases gave rise to a higher ratio of mortality than in 1867 in all the arms except the Foot Guards and Infantry Regiments, the Coast Brigade R.A., and the Army Hospital Corps. In the Foot Guards the reduction amounted to 1·67 per 1,000, and neither in them nor in the Infantry Regiments was it due to increased discharges by invaliding, the proportion in both having been lower than in the preceding year.

Accidents and Violence.—Under this head not a single death is recorded in the Foot Guards, a circumstance to which, combined with the reduction already noticed in the deaths by consumption, the low ratio of mortality in them during the year under review is chiefly to be attributed.

The usual information respecting the sickness, mortality, and discharges by invaliding, in each of the Corps included in the preceding Tables is given in the following Table:—

United Kingdom.

Regiments, &c.	Average Annual Strength.	Admitted into Hospital.	Died. In Hospital.	Died. Out of Hospital.	Total Deaths.	Discharged as Invalids.	Annual Ratio per 1,000. Admitted.	Died.	Invalided.	Stations.
										months.
1st Life Gds.	402	348	2	3	5	9	865·7	12·44	22·39	London 3; Aldershot 1; Windsor 8
2nd ,,	407	155	3	1	4	14	380·8	9·83	34·40	Windsor 3; London 9
R. Horse Gds.	403	264	1	2	3	1	655·1	7·44	2·48	London 12
Total Household Cavalry	1,212	767	6	6	12	24	632·8	9·90	19·80	
1st Dr. Gds.	548	303	4	2	6	5	552·9	10·95	9·12	Aldershot 7½; Sheffield, Coventry, Birmingham, Preston 4½
4th ,,	547	403	2	..	2	20	736·7	3·66	36·56	Aldershot 7½; Brighton, Shorncliffe 4½
5th ,,	547	385	4	..	4	12	703·8	7·31	21·94	Colchester 5; Aldershot 7
6th ,,	547	495	5	1	6	28	905·0	10·97	51·19	Dublin 6; Curragh 3½; Longford, Athlone, Castlebar, Newbridge, Curragh 2½
7th ,,	545	611	2	1	3	23	1121·1	5·50	42·20	Shorncliffe 5; Colchester 7
1st Dragoons	554	383	1	..	1	12	691·3	1·80	21·66	Longford 7; Curragh 3; Dublin 2; Detachts. at Limerick, Athlone, Newbridge, & Castlebar.
2nd ,,	559	333	4	..	4	7	595·7	7·15	12·52	Dundalk 9; Cahir 3; Detachts. at Belfast, Belturbet, Cork, Waterford, Fermoy, Clonmel, & Carrick.
6th ,,	556	790	3	..	3	10	1420·9	5·39	17·99	York 4; Manchester 8; Detachts. at Ashton, Burnley, & Preston.

Regiments, &c.	Average Annual Strength.	Admitted into Hospital.	Died. In Hospital.	Died. Out of Hospital.	Total Deaths.	Discharged as Invalids.	Annual Ratio per 1,000. Admitted.	Annual Ratio per 1,000. Died.	Annual Ratio per 1,000. Invalided.	Stations.	months.
8th Hussars	552	209	2	2	4	12	378·6	7·25	21·74	Manchester Ashton	4⅔
										Edinburgh Hamilton Perth	7⅓
9th Lancers	552	246	2	2	4	12	445·6	7·25	21·74	Cahir Cork Waterford Clonmel Fermoy Carrick	9½
										Newbridge	2½
10th Hussars	557	337	6	1	7	11	605·0	12·57	19·74	Newbridge Curragh	4⅔
										Aldershot	7⅓
12th Lancers	553	370	4	1	5	6	669·1	9·04	10·85	Dublin	9½
										Dundalk Belfast Belturbet	2½
14th Hussars	559	324	4	1	5	19	579·6	8·94	33·98	Edinburgh Hamilton Perth	4⅔
										Newbridge	1
										Dublin	6⅓
15th ,,	552	668	5	1	6	9	1210·1	10·87	16·30	Norwich Birminghm. Coventry Liverpool	4
										York	8
										Detachts. at Birmingham & Coventry	
										Brighton Shorncliffe	5
										Woolwich	2
17th Lancers	553	480	5	..	5	19	868·0	9·04	34·36	Hounslow, Hampton Court, & Kensington	5
Total Cavalry of Line	8,281	6,337	53	12	65	205	765·2	7·85	24·75		
Rl. Artillery:											
B Brigade R.H.A.	963	910	6	1	7	22	945·0	7·27	22·84	A .. Nwbrdg.	12
										B .. Leeds	12
										C .. Dublin	12
										D & E Woolwh.	12
C Brigade R.H.A.	960	817	6	1	7	21	851·0	7·29	21·87	A .. Dorchst.	12
										B Northamptn. Weedn	7⅓
										Norwich	4⅔
										C,D, & E Aldershot	12

United Kingdom.

Regiments, &c.	Average Annual Strength.	Admitted into Hospital.	Died. In Hospital.	Died. Out of Hospital.	Total Deaths.	Discharged as Invalids.	Annual Ratio per 1,000. Admitted.	Annual Ratio per 1,000. Died.	Annual Ratio per 1,000. Invalided.	Stations.
Riding Establishment	212	178	..	..	..	2	839·6	..	9·43	Woolwich 12 months.
4th Brigade.	538	473	1	1	2	..	879·2	3·72	..	A & B: Devonport, Leith Fort 4; Shorncliffe 5; Woolwich 3. C: Aldershot 4; Woolwich; Shoebrynss. 7 4/5
6th „	783	833	10	1	11	21	1063·9	14·05	26·82	Portsmouth, Channel Is. 12
7th „	810	515	11	3	14	8	635·8	17·28	9·88	Nos. 1 & 2: Plymth. 5; Woolwh. 7. Nos. 3 & 6: Plymth. 5; Woolwh. 7. No. 4: Pembrk. Dock; Woolwh. 7 1/2. No. 5: Plymth, Woolwh 12. No. 7: Various stations in Ireld 12. No. 8: Dublin, Athlone 12
9th „	1,468	1,100	14	11	25	29	749·3	17·03	19·75	Hd-Q.. Dublin 12. A: Athlone 7 2/3; Fermoy 4 2/3. B: Limerick 7; Curragh 1 2/3; Dublin 3 1/3. C: Aldershot 4; Devonport 8. D: Dublin 6 2/3; Limerick 5 1/3. E: Kilkenny 5 2/3; Clonmel 6 1/3. F: Fermoy 8 2/3; Curragh 1; Athlone 2 1/3. G: Clonmel 5 2/3; Curragh 2 2/3; Kilkenny 3 2/3. H: Liverpool, Manchstr 3; On march; Leith 8 1/3
11th „	1,437	1,659	15	6	21	23	1154·5	14·61	16·01	A: Shorncliffe 4; Aldershot 3 1/2; Woolwich 4 2/3. B: Shorncliffe 3 2/3; Aldershot 8 1/3. C: Shorncliffe 5; Aldershot 2 1/3; Hilsea 4 2/3. D: Woolwich 5; Aldershot 7. E & F: Woolwh 9 1/2; Shornclf. 2 1/2. G.. Woolwich 12. H.. Hilsea 12

Regiments, &c.	Average Annual Strength.	Admitted into Hospital.	Died. In Hospital.	Died. Out of Hospital.	Total Deaths.	Discharged as Invalids.	Annual Ratio per 1,000. Admitted.	Annual Ratio per 1,000. Died.	Annual Ratio per 1,000. Invalided.	Stations.	months.
12th Brigade	799	793	6	5	11	26	992·5	13·77	32·54	Portsmouth / Channel Is.	12
13th „	786	536	9	2	11	12	681·9	13·99	15·27	Hd-Qrs. 6 Batts.	Dovr. 5
										Hd-Qrs. 5 Batts.	Plym. 7
										2 Batts. in Ireland	12
										1 Batt. Pembroke Dk.	7
17th „	809	744	7	1	8	14	919·7	9·89	17·30	Woolwich	5
										Dover	7
Total Royal Artillery	9,565	8,558	85	32	117	178	894·7	12·23	18·61		
Military Train	678	376	5	3	8	9	554·6	11·80	13·27	Aldershot	12
	472	409	8	1	9	9	866·5	19·07	19·07	Woolwich	12
	359	399	2	..	2	5	1111·4	5·57	13·93	Dublin	12
Total ..	1,509	1,184	15	4	19	23	784·6	12·59	15·24		
Gren. Gds., 1st Bn. ..	816	588	2	1	3	16	720·6	3·68	19·61	Windsor	2
										Aldershot	1⅓
										London	8⅔
2nd Bn. ..	808	586	1	1	2	9	725·2	2·47	11·14	London	12
3rd Bn. ..	813	666	5	1	6	18	819·2	7·38	22·14	London	2
										Curragh	2⅔
										Dublin	7⅓
Coldm. Gds., 1st Bn. ..	806	638	3	1	4	21	791·6	4·96	26·05	London	6
										Windsor	6
2nd Bn. ..	806	632	6	..	6	11	784·1	7·44	13·65	Dublin	2
										London	6
										Windsor	4
Scots F. Gds., 1st Bn. ..	815	593	1	..	1	26	727·6	1·23	15·96	London	12
2nd Bn. ..	814	467	1	6	7		573·7	8·60		London	12
Total Foot Guards	5,678	4,170	19	10	29	101	734·4	5·11	17·78		
2nd Foot, 2nd Bn.	642	635	2	..	2	14	989·1	3·11	21·81	Athlone, Galway, Sligo, Castlebar, & Boyle	6⅓
										Aldershot	5⅔
3rd Foot, 2nd Bn.	649	587	3	2	5	16	904·5	7·70	24·65	Dublin	4
										Bristol and Devonport	8
										Detach. at Exeter	1⅓
5th Foot, 2nd Bn.	648	520	2	..	2	35	802·5	3·09	54·01	Dover	5⅔
										Aldershot	6⅓

United Kingdom.

Regiments, &c.	Average Annual Strength.	Admitted into Hospital.	Died. In Hospital.	Died. Out of Hospital.	Total Deaths.	Discharged as Invalids.	Annual Ratio per 1,000. Admitted.	Died	Invalided.	Stations.	months.
6th Foot, 2nd Bn.	643	502	2	..	2	13	780·7	3·11	20·22	Edinburgh & Greenlaw	4 2/3
										Aldershot	7 1/3
										Detach. at Dundee	2
7th Foot, 2nd Bn.	672	753	4	..	4	11	1120·5	5·95	16·37	Bury	12
										Detachs. at Liverpool & Bradford.	
12th Foot, 1st Bn.	673	615	..	1	1	12	913·8	1·48	17·83	Devonport	12
13th Foot, 2nd Bn.	657	418	3	..	3	5	636·2	4·57	7·61	Portland & Weymouth	8 1/2
										Gosport	3 1/2
17th Foot, 1st Bn.	774	425	5	..	5	11	549·1	6·46	14·21	Kilkenny	1
										Curragh	8 2/3
										Newry	2 1/3
18th Foot, 1st Bn.	654	479	7	2	9	16	732·4	13·76	24·46	Chester, Bradford, & Fleetwood	4 2/3
										Edinburgh & Greenlaw	4 2/3
										Curragh	2 2/3
20th Foot, 1st Bn.	645	468	3	1	4	11	725·6	6·20	17·05	Devonport	5
										Aldershot	7
21st Foot, 1st Bn.	909	590	6	2	8	11	649·1	8·80	12·10	Enniskillen	5
										Curragh	7
										Detachts. at Newry, Armagh, Drogheda, Cork, and Youghal.	
22nd Foot, 2nd Bn.	695	515	3	2	5	4	741·0	7·19	5·75	Newcastle-on-Tyne	12
										Detachts. at Sunderland & Tynemouth.	
23rd Foot, 2nd Bn.	665	414	5	2	7	30	622·6	10·53	45·11	Newport & Brecon	12
										Detach. at Cardiff	3 1/2
25th Foot, 1st Bn.	663	540	4	1	5	12	814·5	7·54	18·10	Glasgow, Ayr, and Paisley	10 1/3
										Aldershot	1 2/3
34th Foot ..	634	830	5	1	6	40	1309·2	9·46	63·09	Portsmouth	5 2/3
										Aldershot	6 1/3
										Dublin	4
39th „ ..	880	526	6	3	9	16	597·7	10·23	18·18	Kinsale, Bandon, Bantry, Skibbereen, Macroom, & Cork	5
										Fermoy, Tralee, and Killarney	3

United Kingdom.

Regiments, &c.	Average Annual Strength.	Admitted into Hospital.	Died. In Hospital.	Died. Out of Hospital.	Total Deaths.	Discharged as Invalids.	Annual Ratio per 1,000. Admitted.	Died.	Invalided.	Stations.	months.
40th Foot ..	628	450	..	..	..	6	716·6	..	9·55	Aldershot	9
										Carlisle, Ashton, &c.	3
43rd „ ..	667	629	5	3	8	8	943·0	11·99	11·99	Aldershot	4
										Channel Isles	8
44th „ ..	666	528	6	1	7	5	792·8	10·51	7·51	Aldershot	1
										Kilkenny, Templemr, Birr, Tipperary	11
51st „ ..	668	568	2	2	4	10	850·3	5·99	14·97	Dover	½
										Aldershot	8
										Portland, Weymth.	3½
54th „ ..	665	689	8	1	9	17	1036·1	13·53	25·56	Aldershot	8²
										Belfast, Carrickfgs, Armagh, Newry, Londndry.	3⅓
56th „ ..	663	420	3	1	4	13	633·5	6·03	19·61	Aldershot, Waterford, Clonmel, Carrick, Cahir	11
57th „ ..	664	643	4	1	5	22	968·4	7·53	33·13	Manchester	3
										Aldershot	9
63rd „ ..	678	470	4	..	4	22	693·2	5·90	32·45	Dublin	5
										Curragh	7
65th „ ..	658	585	4	2	6	15	889·1	9·12	22·80	Kinsale	4
										Curragh	5½
										Dublin	2½
66th „ ..	742	692	5	1	6	18	932·6	8·09	24·26	Channel Isles	4
										Dublin	8
67th „ ..	658	851	5	..	5	40	1293·3	7·60	60·79	Waterford, Clonmel, Carrick, Cahir	1
										Curragh	5
										Portsmouth	6
68th „ ..	663	393	6	1	7	16	592·8	10·56	24·13	Aldershot	1
										Manchester	11
70th „ ..	661	405	8	1	9	9	612·7	13·62	13·62	Ashton-undr.-Line, Carlisle, Whitehvn, Leeds	9
										Kinsale, Cork, Skibbereen, Bandon, Bantry, Macroom	3

United Kingdom.

Regiments and Depôt Brigades.	Average Annual Strength.	Admitted into Hospital.	Died. In Hospital.	Died. Out of Hospital.	Total Deaths.	Discharged as Invalids.	Annual Ratio per 1,000. Admitted.	Annual Ratio per 1,000. Died.	Annual Ratio per 1,000. Invalided.	Stations.	months.
72nd Foot ..	700	323	4	1	5	8	461·4	7·14	11·43	Manchester Dublin Limerick Detachts. at Armagh, Newry, Monaghan, Nenagh, and Clare Castle.	1 7 2/3 3 1/4
80th „ ..	654	476	10	..	10	16	727·8	15·29	24·46	Aldershot Fleetwood Leeds	8 4
81st „ ..	735	578	7	1	8	22	779·6	10·88	29·93	Cork Buttevant Detachts. at Tralee, Killarney, Youghal, Mitchelstown, and Lismore.	4 8
89th „ ..	714	565	3	1	4	11	791·3	5·60	15·41	Dublin Athlone Mullingar Galway Boyle, Castlebar Sligo Ballina	6 6
97th „	648	629	5	1	6	25	970·7	9·26	38·58	Portsmouth Aldershot	5 7
98th „ ..	658	561	4	2	6	22	852·6	9·12	33·43	Portsmouth Aldershot	1/2 11 1/2
2nd Bn., Rifle Brig.	653	729	4	..		20	1116·4	7·66	30·63	Devonport	12
4th Bn., Rifle Brig.	662	373	3	3	6	8	563·4	9·06	12·08	Weedon Chester Detachts. at Leeds, Northampton, and Warwick.	4 2/3 7 1/3
Total Infantry Regiments	25,208	20,369	160	41	201	590	808·0	7·97	23·40		
Depôt, R.H.A.	422	496	2	..	2	5	1175·3	4·74	11·85	Maidstone	12
1st Div., Dep. Brig. R.A.	695	482	4	2	6	5	693·5	8·63	7·19	Sheerness	12
2nd „ „	1,042	1,174	8	3	11	28	1126·7	10·56	26·87	Woolwich	12
3rd „ „	552	515	5	..	5	..	933·0	9·06	..	Warley	12
Total ..	2,711	2,667	19	5	24	38	983·8	8·85	14·02		

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Depôt Battalions.	Average Annual Strength.	Admitted into Hospital.	Died. In Hospital.	Died. Out of Hospital.	Total Deaths.	Discharged as Invalids.	Annual Ratio per 1,000. Admitted.	Annual Ratio per 1,000. Died.	Annual Ratio per 1,000. Invalided.	Stations.	months.
Cavalry Depôt	1,306	1,320	9	2	11	12	1010·7	8·42	9·21	Canterbury	12
1st Dep. Bn.	924	880	8	3	11	35	952·4	11·90	37·38	Chatham	12
2nd „ ..	753	794	11	2	13	19	1054·5	17·26	25·23	Chatham	12
3rd „ ..	697	724	6	..	6	12	1038·7	8·63	17·26	Chatham Shorncliffe	10½ 1½
4th „ ..	789	944	6	1	7	18	1196·5	8·87	22·81	Colchester	12
5th „ ..	701	723	12	6	18	9	1031·4	25·68	12·84	Parkhurst	12
6th „ ..	851	639	11	..	11	17	750·9	12·93	19·98	Walmer	12
7th „ ..	885	526	8	3	11	14	594·3	12·43	15·82	Winchester Detacht. at Marchwd.	12 5
8th „ ..	706	1,163	8	1	9	18	1647·3	12·75	25·50	Colchester Detachs. at Landguard Fort, and Gt. Yarmouth.	12
9th „ ..	1,064	1,000	12	1	13	49	939·8	12·22	46·05	Preston Detachts. at the I. of Man and Fleetwood.	12
10th „ ..	701	634	3	1	4	11	904·4	5·71	15·69	Shorncliffe	12
11th „ ..	1,092	1,225	13	1	14	20	1121·8	12·82	18·31	Gosport	12
12th „ ..	936	744	9	2	11	18	794·9	11·75	19·23	Shorncliffe	12
13th „ ..	1,136	679	15	1	16	27	597·7	14·08	23·77	Pembroke Dock Detacht. at Hubberston.	12
14th „ ..	727	1,060	16	6	22	23	1458·1	30·26	31·64	Sheffield Detacht. at Northampt.	12 4
15th „ ..	918	778	15	4	19	10	847·5	20·69	10·89	Aberdeen Detachts. at Fort George, Stirling, and Dundee	12
Total Depôt Bns.	14,186	13,833	162	34	196	312	975·1	13·82	21·99		

As in 1867, the 1st Life Guards furnished the highest proportion of admissions and deaths in the Household Cavalry, the excess being chiefly in cases of dyspepsia, boils and abscesses, and trifling injuries. The invaliding was highest in the 2nd Life Guards.

The 6th Dragoons at York and Manchester, the 7th Dragoon Guards at Shorncliffe and Colchester, and the 15th Hussars at Norwich and York, had each a very high proportion of admissions, the first two principally from venereal diseases, itch, and boils; and the last from venereal cases, and abscesses and ulcers. The 6th Dragoons had 85 admissions from itch. The admissions in the Cavalry were lowest in the 8th Hussars, quartered at Manchester and Edinburgh. The mortality was highest in the 10th Hussars, chiefly from pulmonary diseases, and lowest in the 1st Dragoons. The invaliding was highest in the 6th and lowest in the 1st Dragoon Guards.

In the Royal Artillery the 11th Brigade had the highest ratio of admissions, the excess being chiefly in venereal diseases, sorethroat, abscesses and ulcers,

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and slight injuries, and the 7th Brigade had the lowest ratio. The highest death rate occurred in the 7th and the lowest in the 4th Brigade, while the highest and lowest ratios of invaliding were respectively in the 12th and 7th Brigades.

The Military Train at Dublin had a high ratio of admissions, to which venereal diseases contributed largely.

In the Foot Guards, the admissions were not excessive in any of the Regiments; the Coldstream Guards had the highest and the Scots Fusilier Guards the lowest proportion. The 3rd Battalion Grenadier Guards, quartered during the year in London, Dublin, and the Curragh, and the 1st Battalion Coldstream Guards in London and Windsor, were the Battalions which had the greatest numbers of admissions; and in both, as well as in the 2nd Battalion Coldstream Guards, the excess was due to venereal diseases.

The highest ratio of admissions in the Infantry Regiments occurred in the 34th, the principal causes being venereal diseases and itch, sorethroat, influenza and bronchitis, and boils and ulcers; the 67th and 2nd Battalions 7th, and Rifle Brigade, were also considerably above the average. The 72nd Regiment had the lowest proportion of cases. The mortality was not excessive in any of the Regiments; it ranged between 1·48 in the 1st Battalion 12th, and 15·29 in the 80th Regiment. The ratio of invaliding was very high in the 34th and 67th Regiments, but this was probably owing to their recent return from foreign service.

RE-VACCINATION.—The results of vaccination in 2,264 soldiers and 15,183 recruits are shown in the following Table, framed from Abstract No. 2 in the Appendix.

	Total number Vaccinated.	Results.	Ratio per 1,000. In those who bore marks of previous Small-Pox.	In those who bore good marks of previous Vaccination.	In those who bore doubtful marks of previous Vaccination.	In those who bore no marks of previous Vaccination or Small-pox.	Total.
Soldiers, not Recruits	2,264	A perfect Vaccine Pustule	259·4	294·0	500·0	482·4	330·0
		A modified ditto	345·9	278·5	260·6	235·3	280·9
		A failure..	394·7	427·5	239·4	282·3	389·1
		Total..	1000·0	1000·0	1000·0	1000·0	1000·0
Recruits..	15,183	A perfect Vaccine Pustule	275·9	278·8	369·7	465·3	292·0
		A modified ditto	309·1	353·8	376·4	231·5	344·7
		A failure..	415·0	367·4	253·9	303·2	363·3
		Total..	1000·0	1000·0	1000·0	1000·0	1000·0

Compared with the preceding year, these results show an increase in the proportion of perfect vaccine pustules, more marked among the recruits than the soldiers; among the former there has been a decrease, but among the latter an increase in the proportion recorded as failures.

The following Table shows the numbers of the recruits passed in each of the Recruiting Districts who bore marks of small-pox or vaccination respectively, or who had no satisfactory mark of either :—

Recruiting Districts.	Marks of Small-Pox.	Marks of Vaccination.	No satisfactory Marks.	Proportion in every 1,000. Marks of Small-Pox.	Marks of Vaccination.	No satisfactory Marks.
London	252	4,183	134	55·2	915·5	29·3
Liverpool	117	1,381	66	74·8	883·0	42·2
Bristol	95	797	25	103·6	869·1	27·3
York	18	693	67	23·1	890·8	86·1
Glasgow	97	749	54	107·8	832·2	60·0
Dublin	16	586	3	26·4	968·6	5·0
Belfast	35	449	88	61·1	785·0	153·9
Total England ..	482	7,054	292	61·6	901·1	37·3
Total Scotland ..	97	749	54	107·8	832·2	60·0
Total Ireland ..	51	1,035	91	43·3	879·4	77·3
Total ..	630	8,838	437	63·6	892·3	44·1

Compared with the corresponding Table for 1867, this shows a smaller proportion of the recruits in all three divisions of the Kingdom bearing marks of previous small-pox. In England there is also a smaller proportion having no satisfactory marks, but in Scotland and Ireland there is a considerable increase in that group, and a decrease in the numbers bearing well-defined marks of vaccination. Ireland still continues to furnish the highest ratio of unprotected men.

SANITARY REPORT.

Camp of Aldershot.

Inspector-General Lawson reports:—

The sickness among the troops at Aldershot in 1868, as compared with 1867, shows a slightly increased rate of admissions and deaths over the previous year, as well as a slightly greater number of sick under treatment, and greater duration of cases. The latter depend in some measure on men being less frequently excused duty without being taken into hospital than in 1867. The increase in mortality has been mainly caused by a very unusual number of deaths from diseases of the heart and arteries.

The Lock hospital has been in operation during the year, though the admissions from primary venereal affections have not as yet been reduced.

There seems to have been a general rise in the ratio of admissions from venereal among the troops throughout the country since 1866, which, however, has been kept in check at all those stations at which Lock hospitals have been in operation.

The accommodation of the married soldiers has remained much as last year. In no case have they been quartered in the same room with single men, and generally each has had one or more separate apartments according to the number of his family.

A portion of the middle block of the Infantry barracks was fitted with ventilating grates, inlets, and air-extracting shafts during the year. These will be extended to all as funds become available.

The latrines in the North Camp continue fitted with open tanks as previously. They were kept in good order, with but few and temporary exceptions.

There have been no changes in the means for cooking, in the quantity or variety of the articles of diet, or in the clothing of the men.

The drainage, with few trifling exceptions, is good.

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Camp of Colchester.

Deputy Inspector-General Gibb gives the following summary for the year under report :—

The Surgeon-Major of the 7th Dragoon Guards has made no recommendations, but states that his regiment has enjoyed excellent health, and that the barracks are the most comfortable and best constructed he has seen in England; the only disadvantage is, the hospital being so far from the barracks, and consisting of wooden huts.

The Surgeon-Major of the 4th Depôt Battalion recommends porches to the hospital huts to prevent wind and rain drifting into them; and also that the ration of meat should be three-quarters of a pound, without bone, to promote the growth and development of young recruits. He does not think that hut accommodation in winter is conducive to health, and that rheumatism, pulmonary, and throat complaints in many instances are attributable to camp exposure. Huts are difficult to warm properly in winter, and the issue of extra fuel is often necessary for this cold and bleak station.

The tub latrine system in camp is objectionable: the adoption of the "dry earth conservancy" would be an improvement.

The Surgeon of the 8th Depôt Battalion is more favourable to camp life, and says that huts are generally healthy quarters, but being cold and draughty, are undesirable for soldiers returning from tropical service. He ascribes many of the admissions for bronchitis and sorethroat to the frequent prevalence of the easterly winds in winter and spring.

He remarks that there were a few admissions from running drill in weakly soldiers, chiefly heart affections, and some for accidents in the gymnasium which, with one exception, were trivial.

During the year a store for the Purveyor has been built, and the garrison chapel was improved in ventilation.

As an experimental arrangement, private ablution places were provided for the men returning to barracks at night, as a protection from venereal disease. As these were only opened in November, it is premature to report on their success. All the Medical Officers in charge of corps have mentioned to him that very few men have yet availed themselves of them.

A Lock hospital, under the provisions of the Contagious Diseases Act of 1866, was completed near the camp, at the end of the year, but was not opened till 27th January, 1869.

The erection of a detached hut, within the hospital enclosure, is much required at this station, for the isolation and reception of women and children in camp affected with smallpox, scarlet fever, &c. These diseases being seldom absent from the town, are introduced every year, at different times, into the camp. At present such cases are placed in one of the vacant hospital huts, for the temporary appropriation of which the sanction of the Secretary of War has to be obtained.

The troops have been healthy, and no epidemic prevailed. A few sporadic cases of small-pox and measles occurred in camp. The total mortality from all diseases in hospital was 16, of which 6 were from phthisis.

Venereal amounted to 40·56 per cent. of all admissions. It is to be hoped there will be a marked reduction in this class next year, from the introduction of the night lavatories, and the establishment of the Lock hospital in the vicinity of the camp.

Shorncliffe Camp.

Deputy Inspector-General Mure reports that the Medical Officers have generally alluded to the injurious influence of the weather on the health of the troops occupying huts, which are pervious to the strong prevailing winds. This is more particularly the case with soldiers returned from the tropics in weak health, and with recruits.

The doors of the huts at Shorncliffe Camp, facing the windward quarter, are not protected by porches, a measure which has been strongly recommended.

If such porches were erected, they would hold the urine tubs at night, and shut them off from the sleeping rooms.

Venereal has also been a fertile source of sickness, but this has abated at Shorncliffe, though not to such an extent as it would were the Contagious Diseases Act extended to the other places in the vicinity, for at Shorncliffe the distance is so small from Dover, that infected women come over.

The prisoners' room of the 10th Depôt Battalion, and indeed all the prisoners' rooms in the camp require warming. This might be done by extending the stove-pipe through the room.

He considers that porches at Shorncliffe, on the weather side of the huts, would assist materially in preventing disease, and the extension of the Contagious Act to Dover, in the same way, would decrease the number of admissions.

The following services have been carried out during the past year in the Camp:—

A new meat store erected: the latrine in detached C Lines reconstructed; surface drainage generally improved; fitments provided in each urinal for private ablution. In several huts the accumulation of shingle has been removed from the ventilators in the brick foundations of the huts. Roof of officers' latrine improved in C Lines.

Lock hospital completed; gas laid on to General Hospital.

Stop cocks fitted to latrines at hospital, to prevent waste of water.

It is proposed to execute the following services during the current year (1869):—

Covering urinals of officers' latrines; completing the improvement of surface drainage; providing cooking ranges for quarters occupied by schoolmasters and staff-serjeants, they being fitted at present with the old pattern grate.

Acquisition by War Department of existing canteens, to be conducted after the regimental system.

Completing the clearing of ventilators in brick foundation of huts under flooring.

Gas to be laid on to Female Hospital, and Laundry, Purveyor's Department.

Providing additional iron ash-bins, and repairing surface drains, and the embankment walls at General Hospital.

South-Eastern District.

The Principal Medical Officer reports:—

Dover.—The exposed position of the barracks, in the opinion of some medical officers, tends to induce pulmonary complaints, as well as rheumatism. Venereal is either directly or indirectly the cause of a great amount of disease.

Grand Shaft Barracks.—Guard-rooms require better ventilation, the lock-up is quite inadequate to the services occasionally required of it; the court-martial and orderly rooms require foul air shafts; tailors' and armourers' shops require better ventilation; the women's washhouse is small, badly fitted up, and badly ventilated; guard-room, at Grand Shaft, is frequently too crowded, there is a cess-pool under the buildings, supposed to be a catch for surface drainage, but sewage reaches it, and must sooner or later be the cause of disease.

Citadel and Western Outworks.—The long casemates are dark, and the ventilation is difficult to regulate; canteen wretched.

South Front Barracks.—Canteen is too limited; infant school wants better ventilation. These generally have been recommended by a Special Sanitary Board, presided over by the Officer Commanding Royal Engineers, the Deputy Inspector-General of Hospitals attending.

Castle Barracks.—Brigade Clerk's room requires a foul air shaft; serjeants' mess requires better ventilation, as also the school room.

The water supply allowed generally for sanitary purposes is deficient.

The ablution rooms require foot-pans. The Long Cliff Casemates are very

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dark at inner end, and defective in ventilation, the means not allowing of a moderate ventilation, and being difficult to regulate. Ablution room in Spur Battery requires better ventilation.

The accommodation at the Castle Hospital requires to be increased.

The Hospital at the Western Heights is old and patched, and no bath room is attached; it has been recommended that the dead-house, next door to the lavatory, may be made a bath-room, and the dead-house detached. The hospital roof is constantly getting out of repair. The accommodation is quite insufficient. Two wards have been built and taken into use, in January 1869, for 20 additional patients, but when three regiments are at Dover, the sick of one regiment have to be sent to Canterbury, and surplus of the others to Canterbury and Shorncliffe.

The following services have been carried out:—

Private ablution rooms at the entrance of the different barracks at Dover.

A new canteen and recreation establishment at the Castle.

The following services are provided for:—Dover Castle—staff serjeants' quarters, basement drainage, and conversion of pit into water closets. Keep Yard—connect ablution room with high-level tank, and convert pits into "McFarlane's" latrine. Cliff Casemates—baths, in ablution room. Bunks have been removed for better ventilation in Long Casemates, gas to be burned constantly there during the winter months.

Hospital.—Improve ventilation of dead-house.

Western Heights, Grand Shaft Barracks.—Provide cisterns to officers' water closets; convert soldiers' urinals into bath rooms; improve ventilation of lock-up.

Citadel Barracks.—Improve ventilation of cook-houses; a new canteen and recreation establishment; and extension of outfall sewer of Provost Prison.

The following services are proposed:—

Increase of accommodation in Castle Hospital; iron ash-pits, in lieu of brick; porches for East Front Casemates baths at the western outworks.

Canterbury.—He considers a bath for the men in the Cavalry Square, absolutely necessary.

Hospital, Canterbury.—The lavatories, baths, fixed basins, and water closets have been thoroughly repaired, and are in good working order.

Chatham District.

Deputy Inspector-General Bowen, in his Annual Sanitary Report, says:—

There have been no special causes of injury to the health of the troops that could have been removed by sanitary measures. The barracks and hospitals have always been found by me in a clean and satisfactory condition.

But few alterations have taken place in the buildings.

At St. Mary's Barracks the ventilation of the bread and meat store has been improved.

At Brompton Barracks some improvements in drainage have been effected, and the latrines in the North Square completed.

At Maidstone, improvements in the ventilation of the canteen and harness room, and the Commandant's house.

An experimental alteration has been made in some of the urinals at the Chatham, St. Mary's, and Brompton Barracks, with a view of providing means of ablution for soldiers returning at night to barracks, and of thereby lessening the danger of infection with venereal disorders. I am of opinion that the plan will not be found to be well adapted for use by the men.

The drainage in the vicinity of the buildings is tolerably good, and no injury to health has arisen from this source.

Woolwich.

Deputy Inspector-General Inglis, C.B., writes:—

The admissions during the year under report were in excess of those of the preceding year (1867). The influences bearing on this increase would appear to be nearly identical with those enumerated by Dr. Barrow, the late Principal Medical Officer. To the zymotic class must be attributed, in a marked degree, this continued augmentation of sickness in the Woolwich Command: the excess continuing to be caused by admissions from tonsillitis, influenza, and rheumatic affections. There occurred also throughout the garrison, 25 cases of smallpox against 17 in 1867. Dr. Barrow attributed the increase of variola, during 1867, to periodical outbreaks of that disease among the civil population of Woolwich from neglect of proper protective measures, and its consequent extension to the troops. The same causes may be urged as still operating in the production of this disease. Coincident with an outbreak of smallpox among the inhabitants principally occupying the low river level, and extending from January to May, the troops suffered in a minor degree until the disease entirely disappeared. Altogether the persons treated in the Herbert Hospital, during the epidemic, included 25 soldiers, 6 women, and 15 children, among whom no deaths occurred; the only fatal case being that of a civilian from the Royal Arsenal. The outbreak was very mild, and every precaution was adopted to limit its action. All recruits and children were vaccinated, and all others not bearing satisfactory evidence of protection, were also similarly treated. While adverting to causes developing an inconsiderable, though appreciable augmentation of sickness during the year, it is with gratification I have to report, that the sanitary measures in operation for limiting enthetic diseases are working tolerably well, and the effect would no doubt be more satisfactory under an extension of the "Contagious Diseases Prevention Act," which at present excludes several large communities in the immediate neighbourhood of Woolwich. The statistics of venereal disease show a decrease of about 68 admissions in favour of 1868, as against the previous year, while not more than half the number of cases of primary syphilis came under treatment by comparison.

In regard to sanitary improvements I append a statement of the services carried into effect throughout the year. It may be observed, in reference to cubic and superficial space in the barracks of Woolwich, that during May, June, July, and August, the rooms were overcrowded. This was occasioned, however, by a temporary augmentation of the garrison, and by the presence of the 17th Lancers, who had to be accommodated here pending improvements and repairs of their barracks at Hounslow. This state of affairs, however, was remedied by the removal of the remaining batteries of the 17th Brigade, Royal Artillery, in June, and on the 2nd August, by the movement of the 17th Lancers to their proper destination, since which the space has not been under the prescribed allotment, as indicated on the door of each room. Certain defects of an insanitary nature were brought to notice at my sanitary inspection in July; one was an objection made by the Officer in Medical Charge of the Military Train to the occupation of the quarters in the lower range or basement of the East Wing of the Military Train barracks, in which I fully concurred. A Board of Military Officers was ordered to assemble, to report on the subject, on the 16th July, who apprehended no immediate amount of sickness by the occupation of the rooms in question, and made certain suggestions in reference to the maintenance of cleanliness in the passages and staircases. I am still of opinion that the basement floor of these barracks, from its low level and proximity to the old drainage system of the building (formerly the hospital), and its evident liability to dampness in wet weather, should, if possible, not be occupied by the troops or their families.

Among the sanitary services which have been performed at Woolwich by the Royal Engineer Department in 1868, are the following:—

Central Division, Royal Artillery Barracks: Barrackmaster's office—water-closet and urinal for officers erected.

Royal Artillery Canteen: water-closets, drains, and latrines renewed.

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Western Division: drainage of married soldiers' quarters on Woolwich Common. This service is in progress.

Military Train Barracks: cesspits removed, and soil pipes and drains from Officers' quarters constructed.

Royal Military Academy Division: No. 8 Staff Serjeant's Quarters—water-closet removed to back yard.

Herbert Hospital: three water-closets and three urinals under operating ward.

South-Western District.

Deputy Inspector-General C. A. Gordon, C.B., reports that:—

During the past year such improvements as were practicable were carried out with respect to barracks and hospitals in the South-Western District by the local authorities, and steps were taken to obtain authority for those that required special sanction.

The following is a brief statement of the steps taken, and in contemplation to carry out various sanitary suggestions that have been made, viz.:—

Portsmouth.—Clarence Barracks being old and out of repair, plans have been submitted for a large range of buildings to extend from that site to the Cambridge Barracks.

Cambridge Barracks.—An item has been inserted in the estimates for new buildings for the Staff Serjeants.

Private ablution rooms have been erected.

The state of the lock-up is to be improved, an item for the purpose having been sanctioned in the Army Estimates.

Anglesey Barracks.—Various improvements have been effected in the ventilation of married quarters. Plans have been submitted for enlarging the prisoners' room.

Private ablution rooms are also to be erected.

Southsea Castle.—The use of carbolic acid has been allowed for latrines that are of faulty construction.

The water supply is under consideration, with a view to being improved.

Garrison Hospital.—The insanitary conditions, caused by the vicinity of the moat, are about to be remedied by filling it up with the *débris* of the fortifications in course of destruction.

Hilsea.—The ablution rooms have been repaired, and additional bath accommodation included in the Barrack Estimates.

Gosport Barracks.—The objectionable nature and position of the latrines for married women and children has been reported, as have also been the want of suitable means for warming the lock-up room, and the requirement of proper accommodation for men, women, and children. Items for the improvement of all these have been included in the Annual Estimates.

Fort Monckton.—Improvements have been made in the latrines for the officers, but those for the men and women, although frequently reported, continue in an unsatisfactory condition.

Fort Elson.—Improvements have been effected in the state of drainage.

Garrison Hospital, Gosport.—The building occupied by the sick of the Royal Artillery having been found old and unsuitable, was appropriated for infectious cases, and for use by the orderlies; all the sick being accommodated in new buildings.

A main feature in the ventilation of barrack rooms is that of providing a certain area of inlet and outlet communication with the open air, specially applied for ventilation, and irrespective of that by windows and doors. The sectional area of the inlets and outlets has been laid down in the Report of the Commission for improving the sanitary condition of barracks and hospitals.

This mode of ventilation is more particularly useful during the winter season, as soldiers will not leave the windows open in cold weather, and the admission of fresh air, if solely derived through these, is found to be practically insufficient. It has been considered that if these special aper-

tures are open and working, they will afford a removal of air twice every hour, that is, if 600 cubic feet of space are given per man in a barrack room, that 1,200 cubic feet of air will be provided for each occupant per hour. The completion of such a change of air will depend upon a number of conditions; it is not to be relied upon, and practically, it is not always obtained. The Sherringham valves, usually used as inlets, are under the control of the men, to obviate, in extremely cold weather, the admission of too much cold air. Soldiers, however, are in the habit of closing these openings when there is no real necessity for their doing so. This is especially the case at night, when the fires are out. It has been recognized as a portion of this system, that a part of the air from without should be warmed by passing along the large heated surface of the back of the grate, and in contact with the flue, obtaining admission to the room near the ceiling above the fireplace. This, with the heat of the fire, is considered sufficient to keep the air in a room, so ventilated, sufficiently warmed, but as at night, the fires are usually out, the warmth intended to be thus supplied is not furnished, and this induces the men in winter to close the apertures specially provided for ventilation. It would be difficult to obviate this entirely; supervision is found practically insufficient, and the alternative which has been most strongly recommended is to supply more fuel, sufficient to keep the fires alight through some portion of the night. It has, however, been denied that with only 600 cubic feet per man, with this system of ventilation, the air in winter can be kept sufficiently pure in a barrack room. It has been advocated that more than twice the amount of air should be supplied, that instead of 1,200 cubic feet of air per hour, per head, nearly 3,000 should be given. It is obvious that to provide this amount in a cubic space of 600 feet would be a very difficult problem, and practically not obtainable without occasioning draughts that could not be borne, as the removal should be fully five times in an hour. This conclusion is founded on the results of experiments, and chiefly from the amount of carbonic acid impurity found in the air of barrack rooms, as compared with the condition of the outer air. The amount of carbonic acid in the outer air may be designated the initial quantity. Numerous experiments have shown that, if the initial amount is in the ordinary proportion of, say, ·4 per 1,000, the amount in a barrack room, ventilated as described, and giving 600 cubic feet to each occupant, will generally greatly exceed this. It has been observed that ·6 per 1,000 volumes of carbonic acid impurity is not appreciable to the senses, but from that to 1·0 is; the latter very decidedly so. Soldiers, however, are continuously in their barrack rooms only at night, and it is not very clear what amount of carbonic acid impurity, submitted to only for a limited period, is positively injurious. In a clean barrack room, containing healthy men, and having no sources of impurity, except those from respiration and other emanations from the occupants, the amount of carbonic acid is a very close criterion of the organic impurity. No doubt, however, that the greater the departure from the condition of the outer air, if ordinarily pure, the more will it be unsuited to respiration, and though the exact limit may be indeterminate, especially where only breathed for a portion of the twenty-four hours, yet we know that in civil institutions the effects of foul air have been, and are, constantly productive of the most serious evils, and it is a fact, that the greatly improved health of the British Army in late years, especially as regards the prevalence of phthisis, is largely dependent upon the increased cubic space and improved ventilation of barrack rooms.

Barrack rooms may be estimated as fully occupied for about nine hours out of the twenty-four all the year round—somewhat less probably by Cavalry and Artillery, more especially in summer—and it becomes a question for consideration, whether the amount of impurity found to exist in the atmosphere of the best ventilated barrack rooms is so injurious to the health of those submitted to it as to need a remedy, the remedy being an increase of cubic space beyond 600 cubic feet per man. The only answer we can at present offer is, that much benefit has resulted from the provision of 600 cubic feet and improved ventilation, and that in well constructed barracks at home, where this space and ventilation are provided, the direct effects of a condition of atmosphere, which must be admitted as impure, is not, from our present information, productive of those epidemics or classes of disease which are recognized as

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resulting from crowding, or vitiated air. How far, however, diseases of more insidious character may still be thus produced is not so readily appreciable. Typhus fever and ophthalmia, at one time not so rare amongst troops on home service, are now of very infrequent occurrence, and phthisis and hæmoptysis, the deaths from which, in the 10 years from 1837 to 1846, were at the rate of 8·7 per 1,000, were in 1867 and 1868 but 3·3 and 3·2 per 1,000 respectively.

The provision of a greater space than 600 cubic feet per man would of course be attended with a large increase of expense, and though this is laid down as a minimum, it could hardly be expected that the Government would, from the amount of evidence derivable from our present experience, provide more than 600 cubic feet for each occupant in the sleeping rooms of barracks. But the experiments recently made by Dr. de Chaumont clearly show that, if the condition of the atmosphere in rooms giving this space when occupied, is not satisfactory, when 500 cubic feet are given it is much less so: in fact the deterioration bears an exact proportion to the diminished space.

For example, the temperatures were higher in rooms where 500 feet were given than in those with an allowance of 600 cubic feet, and the air moisture was "markedly higher" in the former. The carbonic acid ratio was "very much higher," and the organic impurity was likewise greatly in excess in rooms affording 500 cubic feet to each occupant. The excess of impurities in the air of these rooms was "exactly proportional" to the additional number of persons in such rooms.

This system of ventilation is considered as independent of doors and windows, but there is no doubt that the shape and construction of the barrack room greatly influence the character of the ventilation. If the room in its long axis is exposed to the air on two sides, the inlet openings will be on opposite sides, which is very material. Again, even in winter, the windows can be occasionally opened, and in summer are of the highest value.

At this station there are several old barracks, and some of the worst in England, bad in situation, and bad in construction; some of them, though comparatively not long built are faulty, in that they perpetuate structural defects. The Anglesey Barracks, built in 1849, have many features of merit in arrangement, but the barrack rooms have windows only on one side, the rooms being back to back on each side of a central passage. The atmosphere in them was found on a recent occasion to be more impure than that in the new Gosport barrack rooms, where there are windows at each end, showing that this species of ventilation, though imperfect, is better than where apertures only exist in one wall.

This was further established by the experiments made at Fort Brockhurst, where the casemates have ventilation at the ends, with inlet and outlet shafts. It is difficult as a rule to ventilate casemates, and in long ones, like those at the Castle at Dover, impossible; yet we have an example of casemates at the South Front Barracks at Dover, where there is little doubt that the condition of the atmosphere in them, when occupied, would be found superior to that of barrack rooms where cross ventilation was not obtainable.

It has been objected to barracks constructed with windows at opposite sides, that they are too cold in winter from draughts from the opposite windows. If the windows are properly fitted this should not be the case, and though so much glass tends to lower the temperature, if sufficient fuel is provided, the cold should not be excessive. We have extensive practical experience in Ireland of this form of barrack room. For instance, Parsonstown and Naas Barracks, and many others, are built on this plan, and complaints of their coldness are not made. There is nothing new in the principle. It may possibly be found expedient in future constructions, in exposed situations, to diminish somewhat the number of windows, but the principle of cross ventilation for barrack rooms would seem the right one.

Chichester.—The employment of dry earth as a deodorant in the cesspool privies was adopted with great advantage.

Winchester.—Improvements in connection with latrines used by the officers and families have been included in the Estimates for 1869–70.

The system of drainage will be altered and improved in connection with the general scheme for the city. An item for adding to the ablution accommodation has been included in the Estimates for 1869–70.

Marchwood.—An item has been noted in the Estimates for 1870-71 for enlarging the guard room.

The latrines and urinals are to be altered and improved.

Parkhurst.—Improvements have been effected in the ventilation of the hospital.

Weymouth.—An item has been noted in the Annual Statement for erecting a bath room for the use of the sick.

Portland.—An item has been included in the Annual Statement for a suitable building for an infant school.

Netley.

The Annual Sanitary Report of the Royal Victoria Hospital, Netley, submitted by Inspector General G. S. Beatson, C.B., Principal Medical Officer, contains remarks on the following heads :—

During the year 1868, the number of patients admitted in the Royal Victoria Hospital was 4,102.

The following is the detail of those admissions :—

Invalids from abroad	3,950
(Of whom 748 came by overland route from India.)	
Invalids from home	23
Army Hospital Corps	111
Garrison patients	14
Extra ditto	3
From pass	1
Total	4,102

The Garrison patients were men from Royal Engineers, Southampton; from Detachment Military Train at Netley; and Guardsmen from London.

The extra patients were two officers of the American Navy, and a soldier's child.

Overland Route.—The invalids who have arrived during 1868 by this route do not seem to have suffered from the sudden change of climate; it is, however, to be remarked that this winter has been, especially in the south of England, a very mild one in regard to temperature, although characterized by a succession of heavy gales, the results of which have been very many sad disasters at sea.

My own belief, however, is, notwithstanding the absence of any unfavourable results to invalids by the overland route during the present season, that it will be found expedient to follow, as far as possible, a recommendation which I made before leaving India, viz., to defer the embarkation of the large bulk of the invalids till the departure of the later troop-ships in March of each year; and, as a result of such an arrangement, to defer the assembling of the Divisional Invaliding Boards in India till January. Hitherto it has been necessary, in order to get men away from India in January and February (so that they might reach England—viâ the Cape—in May and June), to hold the Invaliding Boards in October, or just at the end of the hot weather, at which period of the year many men have been invalided who would not have been so in January, that is, after the effect of two months and a-half of cold weather was apparent in the improved condition of many men who may have looked ill enough to require change before they had the benefit of the invigorating cold of the north-west of India, and of the Punjab during November and December.

There will, however, be other cases which will require earlier removal from India, and one difficulty attending the rapid transit by Egypt is, to be able to give men such early removal without suddenly precipitating them into the extreme cold of an ordinary English winter, the fact being that, with all its drawbacks, the Cape route has many counteracting sanitary advantages for sickly men, for of this class many cannot so fully benefit by any other route

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which has not the advantages of the mild equable climates which an invalid passes through on leaving Calcutta or Bombay in the end of January, and reaching England in the end of May.

Transport of Invalids from Portsmouth or Spithead to Netley.—The question has come up lately whether the present arrangement of sending invalids by sea to Netley, or arranging for their transport by rail from Portsmouth, would be attended with least inconvenience and exposure. That there is always considerable risk of delay and exposure in the case of men arriving by water is undoubted; and I have seen at least two occasions when such exposure and delay occurred, owing to the vessel's not arriving till after the top of high water, at which period of the tide only can the men be landed with comfort and convenience at the pier at Netley, which structure, to be of real service, should have been extended at least another hundred feet, or even one hundred and fifty, and been so formed that a steamer with light draft of water could come within a barrier which would protect her, while lying alongside of the pier, from a strong S.W. gale, and sea.

It must also happen that, to meet the time of high water at Netley, invalids and sickly men have to be transhipped from the transport at Portsmouth or Spithead to the smaller vessels which are to convey them to Netley, at very unseasonably early hours for sickly and weakly men, so that, altogether, considering that a large number of invalids will in the future arrive at Portsmouth during the winter, I think a great deal may be said in favour of bringing them to Netley by rail.

If the contemplated connection of Netley and Fareham by rail be carried out (and a Bill has been obtained for this extension of the Netley line), and if a few carriages suitable for men seriously ill were always available, I do not think much difference of opinion would exist as to the advantages for weakly men of this route over the present one by water. By the extension of the railway, and the construction of a short hand-tramway, the men could be landed at the hospital door, and those who were seriously ill carried in their cots to the wards. By such means it seems to me that the greatest amount of convenience, and the smallest amount of suffering and of exposure, would be secured.

Water Supply.—As far as I can ascertain, there has been no difficulty experienced during the past year from any deficiency in the fresh water supply; and lately a new and much larger main has been brought from the reservoir to the hospital, by which a larger command of water can be obtained in case of fire. The reservoir is capable of holding about four million gallons of water, and its capacity could be easily increased by bringing the retaining embankment (or bund) lower down in the ravine. I am not, however, aware how far the sources of supply would fill a larger reservoir. The supply of water from the artesian wells has, on the whole, been also satisfactory.

Swimming Bath.—This large salt-water bath I consider to be practically useless, for the reasons given in my remarks attached to the Sanitary Report for the month of July 1868. Nothing will suffice to ensure a full, steady, and renewed supply of salt water to this bath, short of the erection of a small steam engine at the end of the pier. By means of such a power the water in the bath could be partially renewed every day, and wholly so once a week or oftener.

Officers' Quarters.—This building is in an insanitary and most uncomfortable condition, and must continue to be so until the front and end walls are rendered impervious to damp. Nothing will effect this but a substantial coating of Portland cement, which it is hoped will be laid on during the coming summer.

Married Soldiers' Huts and Orderlies' Barracks.—These are all in good condition and comfortable, and so are the single men's rooms, which are always kept in clean and neat condition, and duly ventilated.

Hospital Waterclosets and Urinals.—There have been no complaints with regard to the working and sanitary state of these appurtenances, which, with bath and ablution appliances, are in close vicinity to each of the wards.

Drainage of Hospital.—There have been no indications of defective drainage or sewerage in connection with the main conservancy arrangements of the hospital and officers' quarters, but attention has been called to the imperfect state of the surface drainage around the building, and the defects, as far as

possible, remedied. The defect, however, cannot be remedied in full until a grant of money is sanctioned. This grant will be asked for in the next annual estimate. *United Kingdom.*

Lunatic Asylum.—This new building is not yet ready for occupation, but is rapidly advancing to completion, and will no doubt be completed in the course of the coming summer.

There are two desiderata among those mentioned by my predecessor in his report for 1867, which I consider very necessary. The first is the establishment of a small female hospital, with attendant nurse, for the use of sick women and children of the Army Hospital Corps and of invalids: and, secondly, a tram or horse railway from station to rear of hospital.

Devonport, Plymouth, and Western District.

Deputy Inspector-General Ferris reports:—

The health of the troops has been satisfactory during the past year.

With regard to the working of the Contagious Diseases Act at this station, there are many circumstances which tend to render it difficult, arising in the civil population, and from the importation of disease by sailors from foreign parts, and prostitutes from unprotected districts. Until amended legislation has taken place no very great results can be reasonably expected. The character of venereal disease has been favourably modified, rather than that the number of admissions decreased. Less severe forms of disease are now met with than formerly. It is to be remarked, that cases have occurred where women have come from adjacent towns with the desire to be admitted into the Lock Hospital. I regret to state, however, that there have not been so many women reclaimed latterly as when the Act first came into operation, nor do they now contribute so much to their own support.

The extreme heat we experienced during the summer does not appear to have caused any unusual number of admissions among the men for any particular disease, except "ophthalmia," an outbreak of which occurred in the detachment of the 2nd Battalion 3rd Buffs, which was quartered at the camp, Staddon Heights, for rifle practice; but this regiment having suffered when abroad from the disease, was peculiarly liable to contract it again. Sanitary measures to suppress the outbreak were successfully and speedily carried out. Several cases of typhoid fever took place in the summer among the soldiers' children in the married quarters, Raglan Barracks; also at New Granby. Some of the married people of the 13th Brigade Royal Artillery at the Citadel are badly off for quarters; some of them being below the level of the soil are naturally damp, dark, and ill-ventilated. Surgeon-Major Bone has drawn attention to this in his Sanitary Reports, and has recommended that the women and children should be removed to quarters above the soil at present used as barrack store-rooms. This has since been done.

An unsuccessful attempt was made to make the back wall of the married quarters, New Granby Barracks, impervious to the wet.

With respect to ventilation, it would be well if all ventilating contrivances were placed beyond the control of the men. Until this is done they will shut up at night any valve to which they may have access. The foul air shafts at Raglan Barracks admit the wind and rain in stormy weather; recommendations have been made on this head. The rooms at the Citadel are deficient in ventilation, being placed back to back. In compliance with recommendations, ample ventilation has been afforded to the prisoners' room at Mount Wise Barracks. A recommendation was also made that the pavement outside the stables at New Granby, where a battery of Royal Artillery is located, should be cemented between the stones in order that the urine might run off, and that the drain should have a greater fall. This has been paid attention to. An open sewer, running underneath the graveyard close by, emptied itself near the administrative portion of the hospital. This has

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been covered over and carried out into deep water, thus avoiding a great nuisance which formerly existed. The hospital has been undergoing repairs at the hands of the Royal Engineers. The warm water supply to the hospital is, from faulty construction of the pipes, very bad; alterations are constantly being made without lasting effect. The female hospital was opened at the beginning of the year.

The gymnasium at Stonehouse, opened in November 1868, continues to exercise its salutary influence on the physique of the men. The average increase has been:—

Weight.	Chest.	Fore Arm.	Upper Arm.	
4 lbs.	$1\frac{9}{8}$ in.	$\frac{4}{8}$ in.	$\frac{6}{8}$ in.	Number of men examined, 539.

The distance of the gymnasium from Devonport is objectionable; and a new building in a suitable position at Raglan Barracks is to be built.

Northern District.

Deputy-Inspector General Bent reports:—

That in no case have any of the forms of disease, classified in the accompanying Abstract, been ascribed by Medical Officers to insanitary conditions within the barrack precincts.

At Sheffield, where in the early part of the year variola occurred to a limited extent among the 14th Depôt Battalion, the infection was apparently imported from the lower parts of the town in every instance. Owing, however, to the vigorous disinfectant measures employed, the disease did not spread either in the barrack rooms or hospital. Of the cases reported, only one proved fatal.

No sanitary reconstructions of any importance have been carried out, though various minor improvements in the state of the latrines, and conveniences for ablution, have from time to time been effected as they were required.

Out of the total of 7,074 cases of disease in the northern district, no fewer than 2,223, or more than one-third, come under the enthetic class, while a considerable proportion of those of the remaining classes were indirectly due to the ravages of syphilis. It has been, therefore, with a view to imposing some check on this perpetual loss of effective strength in the ranks, that I have urged, through the military authorities, the extension of the Contagious Diseases Act to, at least, the larger garrisons of this district.

Special conveniences for ablution have already been constructed at the Salford Barrack; and at slight expense a similar arrangement might be made wherever a regiment or detachment is quartered.

North Britain.

Deputy Inspector-General Home reports:—

The average strength of the force in the North British Command during the year 1868, was 3,179 non-commissioned officers and men; this strength being at its maximum (4,151) in May, and at its minimum (2,806) in December.

The stations of the largest number of the troops during the period has been Edinburgh, next to this Aberdeen, and then Glasgow. No new station has been occupied during the year, nor of those where detachments were formerly quartered, have any been evacuated, with the exception of Fort George, where, since October, only a few men of the Coast Brigade of Artillery have been stationed.

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A few remarks on the amount of sickness among the troops may not be uninteresting. The number remaining sick on every Friday throughout the year has been on an average exactly 3 per cent. of the force, the highest rate being 4·3 in the second week of March, the lowest 2·3 in the beginning of November.

In comparing the health of one station with another, the most striking circumstance is the slight difference that exists between the larger garrisons quartered in the towns, and the smaller detachments in more country districts. In the former, including Edinburgh, Glasgow, and Aberdeen, the number remaining sick each week was 3·2 per cent., while at the smaller stations, such as Paisley, Ayr, Hamilton, Dundee, Stirling, and Perth, it was but a small fraction under 3.

The different large stations compared with one another likewise manifest a remarkable uniformity in their health-rate; the average number on the sick list at Glasgow at the termination of each week being 3·1 per cent., at Aberdeen 3·2, and at Edinburgh 3·3; each of these stations, it may be remarked, has special circumstances belonging to itself, whereby its sick list is increased. At Aberdeen, the Depôt Battalion being composed of young soldiers, and such as have been invalided from their regiments abroad, may be naturally expected to have its sick list unduly high. At Glasgow, where the barracks are confessedly in a bad sanitary condition, both as regards locality and age, the health of those quartered in them may well be supposed to suffer accordingly: while Edinburgh, where the periodical gathering of invalids from all the other stations in Scotland takes place, will, on this account, undoubtedly show a higher proportion of sick than properly belongs to it.

Some diversity becomes apparent when the health of the various corps that have served in Scotland during the year are compared; the 1st Battalion 25th Regiment for instance, stationed in Glasgow, had the highest sick rate, an average of 3·6 appearing on their sick return weekly; the 42nd Regiment, though but just returned from India, show a smaller proportion, viz., 3·4; the 2nd Battalion 6th Regiment, still fewer, 3·1; whilst the 1st Battalion 18th Regiment, with a weekly percentage of 2·1, was the healthiest of the whole.

With regard to the classes of disease by which inefficiency has been chiefly caused, by far the greatest number of admissions into hospital have been due to gonorrhœa and syphilis in its primary and secondary form. Venereal complaints taken collectively have been the cause of a third of the whole admissions throughout the year.

It is satisfactory to be able to state that not a single case of small-pox or cholera appeared anywhere throughout the year, and that but two cases of scarlet fever, one of measles, and one of typhus, occurred, all of which terminated favourably. But 10 fatal cases took place in hospital, exactly half of which were due to consumption, and two of the remainder to heart disease. These two diseases were also the principal causes of invaliding, more than a half of all the invalids discharged from the service having owed their inefficiency to these complaints.

It is a matter of congratulation to be able to report a gradual improvement as taking place in the amount of space allotted to the troops at the various stations in the command. The most defective barrack in this respect has been Leith Fort, arising from the appropriation of the soldiers' quarters to other than the proper purpose, such as serjeants' mess, shoemakers' shop, schoolroom, &c., whereby the average space was reduced to 432 cubic feet per man. The Major-General Commanding, having had his attention directed to this subject, has succeeded in effecting a most beneficial change, and the men at that station are now much better off in this respect than they were before. At Hamilton alone of all the stations in Scotland, have the troops less than 500 cubic feet of space per man; at Edinburgh they have 582; and at every other barrack at present occupied in the command they are either in the enjoyment of the standard allowance of 600 cubic feet or more. The most crowded guard-room is that at Aberdeen, where the present allowance is but 388 cubic feet; all the others throughout Scotland are in this respect satisfactory, and vary from 510, as at Stirling, to 858, as at Hamilton.

The leading improvements made in the barracks and other buildings con-

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nected with the accommodation of the troops in Scotland during the past year, have been the construction of a new meat store at Ayr, a straw store at Perth, and a new coal yard in Edinburgh Castle.

An extensive alteration and improvement has been made in the drainage at Fort George, where it was much required, the latrines and ashpits have there also undergone considerable changes for the better.

At Perth a special water-closet has been erected, and at Broughty Castle, water, which was previously obtained as an indulgence from private sources of supply, has been permanently laid on by pipes.

At Edinburgh Castle an ashpit has been demolished in order that a coke house, required to supply the stove in the lock-up, and also a particular cooking apparatus recently introduced, might be erected in its place. In the cook-house of the same barracks Warren's cooking stove has taken the place of Benham's apparatus, which, not being found to answer, has been removed.

The ventilation of Barrack Rooms 2, 3, 4, and 5, in Edinburgh Castle, has during the past year been much improved by the removal of part of the old wall in front of the casemates on the ground floor.

IRELAND.

Deputy Inspector-General J. H. Kerr Innes, C.B., reports:-

The miasmatic diseases were thus distributed:—Dublin, 12, to which must be added 3 from cerebro-spinal meningitis—a disease which was still prevalent amongst the civil population during the early months of the following year; Curragh, 3; and Cork, 16. The number of admissions from this cause at the Curragh has been large, owing, probably, to damp, and the increased exposure to which the men have been subjected, but the mortality has been low.

Amongst the stations in the Cork district, Buttevant may be enumerated as furnishing a large proportion of miasmatic diseases: the causes to which the repeated visitations of fever at that station may be assigned are somewhat obscure. The water used by the troops, when analyzed, has not evidenced the presence of an undue amount of organic matter, and the only probable source of the evil seems to be the existence of cesspits. Provision has already been made for the reorganization of this faulty system of conservancy.

During the year, considerable expenditure has been incurred in extending the cubic space available for the troops, in the extensive introduction of new cooking ranges, in the improvement of the means of ablution, and in the conversion of old cesspits into latrines on the modern principle.

Dublin Division.

Deputy Inspector-General Innes, C.B., reports:—

Although the admissions for the current year have ranged considerably below the average, the deaths have not diminished in a like proportion.

Meningitis is reported as having proved fatal in two cases, and cerebro-spinal meningitis in three—five deaths out of a total of six admissions. The first-named disease occurred at Island Bridge Barracks in May last, in the persons of two men of the 6th Dragoon Guards. H.M. 12th Lancers at that time occupied the Royal Barracks on the other side of the river; two of their cases of cerebro spinal disease occurred in the month of February, and one in April. The deaths in this part of the town from the same cause were frequent amongst the civil population.

Considerable improvements in the Barrack accommodation have been effected throughout the district, but much remains still to be done. In Dublin itself the amount of cubic space and area space accorded to the troops has always been below that sanctioned under the new regulations. In the early months of the year there was much overcrowding; the removal of the head-quarters of the 2nd Battalion of the 17th Regiment to Mullingar was carried

out in consequence of representations to this effect, and a small amount of additional space was thus made available, but the proportion still remained very faulty. A sum of money has been granted in the estimates for the current year for increasing the accommodation in the Royal Barracks; it is in these buildings that the deficiency of space has been most felt.

In the districts at a distance from the capital, the proportion of cubic space has usually ranged at from 400 to 500 feet. The very crowded and ill-ventilated state of the Barracks at Drogheda has, during the year, been represented to the military authorities. Measures are now in progress for the improvement of the sanitary condition of this station.

The following précis includes the most important improvements which have been made during the year in the several military stations of the command:—

Dublin.—New married quarters have been erected in connexion with Ship Street Barracks. Laying on Vartry water.

Portobello Barracks.—New recreation rooms, new latrines, and improved drainage.

Richmond Barracks.—Erection of night ablution room.

Royal Barracks.—Erection of a new female hospital.

Dundalk.—Erection of new married quarters.

Besides the above, new ovens, on McFarland's plan, have, in many instances, been introduced, and it is proposed to extend the advantages of these as funds become available.

The old latrines on the cesspool system, which so generally obtains throughout the district, are in gradual course of conversion into closets duly flushed with water.

The Curragh Camp and District.

Deputy-Inspector General Guy reports:—

That during the past year the following alterations have been made, which are calculated materially to increase the comfort and healthiness of the troops.

Seven school rooms have been converted into recreation rooms, which from their comfort, offer every inducement to the well-disposed to resort thither instead of repairing to the tap-room. In the recreation rooms are provided books (chiefly obtained from the Garrison Library), and papers of all kinds, with bagatelle, chess, and backgammon boards; coffee, with other refreshments, as ham, beef, eggs, bread, butter, cheese, &c., of excellent quality and at moderate prices, can also be obtained.

In each of the lines increased and more suitable provision is being made for married soldiers, by the conversion of serjeants' huts into four rooms, and by subdividing soldiers' huts into three compartments. Both (especially the latter, which is the plan now fixed on) afford excellent accommodation, the rooms being of sufficient size, adequately ventilated, and warmed by the new pattern grates.

A new and admirably appointed gymnasium has been opened for use.

A night ablution room is nearly completed.

In hospital, a great and most desirable improvement has been carried out in the reduction of the number of beds in the wards, the larger ones being reduced from 24 to 18, the smaller from 12 to 8, thereby affording (even if the wards are completely filled, which is seldom the case) each patient nearly 500 cubic feet of air.

Improvements sanctioned, but not yet carried out.

1. Erection of sheds for shelter of troops during rifle practice.
2. Lock hospital for women will be ready for occupation in early autumn.
3. Cemetery at a convenient distance from camp to be opened in summer.

Alterations at Newbridge.

1. Erection of an urinal near canteen.
2. The removal of partition wall in hospital grounds, affording increased light and ventilation.

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Works proposed to be carried out in 1869-70.

Curragh.—1. Laying on of water to slaughter-house and efficient drainage of the same, as well as reconstruction of abattoir.

2. Revision and redistribution of surface drainage, so as to prevent so much waste water flowing into foul water reservoir. This will admit of more perfect deodorization of the latter, and render its contents more suitable for agricultural purposes.

Newbridge.—1. Increased water supply and from purer source, with more efficient surface drainage.

2. Conversion of womens' washhouse into an ablution room.

3. Erecting ablution rooms in houses O, P, Q, and T.

4. Erection of latrines in rear of houses W, Y, and Z.

5. The placing of water-closets in officers' quarters, canteen, and cells.

Hospital.—6. Building of water-closet and bath room, and equipping ablution room with basins, &c.

When these improvements are effected, the sanitary condition of the buildings in the Command will be satisfactory. Additional bath accommodation is desirable for Curragh, and was promised to be included in next Estimates.

Cork District.

Deputy Inspector-General Prendergast writes:—

During the early part of September an epidemic fever of low type appeared amongst the troops stationed at Buttevant. At first the Medical Officer in charge supposed that it might be imputed to the insanitary condition of the latrines, all of the old cesspit construction. I proceeded to Buttevant and made an enquiry as to its probable cause, and though I found the cesspits in a very insanitary condition, I could not point to them as the direct cause of the outbreak of fever. A Board of Medical Officers was subsequently convened (of which I was President), by order of the Commander of the Forces in Ireland, to report as to the probable cause of the occurrence, but failed to trace it to any particular source.

In December another outbreak occurred, but this was slight, and disappeared in a few days.

The very defective state of the latrines throughout the district are constantly reported on by Medical Officers in charge. With the exception of those at Limerick, they are all of the old cesspit construction. Those at Cork and Buttevant are about being reconstructed, and the others will, it is hoped, be so as soon as funds are available.

At Waterford, Carrick-on-Suir, Duncannon Fort, Charles Fort, Bandon, Nenagh, and Mitchelstown, the old boiler is the only means of cooking. Modern ranges are much required.

During the past year the re-appropriation of barracks through the district has been effected, with some good results as regards increased cubic space, but yet over-crowding is reported to exist in many barracks.

The cubic contents of some of the guard-rooms, as also the superficial area, are much restricted, especially at Cork, Clonmel, Kilkenny, Haulbowline, Templemore, Tipperary, Waterford, Buttevant, and Ballincollig; and all have been repeatedly reported on, and are included in Estimates for 1870-1.

Section II.

On the Extent of Invaliding.

The following Table shows the amount of invaliding per 1,000 of the strength of the Troops serving in the United Kingdom, and also the proportion in each arm of the Service separately:—

	Troops generally.	Household Cavalry.	Dragoon Guards and Dragoons.	Royal Artillery (including the Depôt Brigade.)	Military Train.	Foot Guards.	Infantry Regiments.	Depôt Battalions.	Royal Engineers and Departmental Corps.
Strength	78,261	1,212	8,281	12,276	1,509	5,678	25,208	14,186	3,900
1868.. Number discharged as Invalids	1,712	24	205	216	23	101	590	312	33
1868.. Ratio per 1,000 ..	21·88	19·80	24·75	17·59	15·24	17·79	23·40	21·99	8·46
1860-67, Ratio per 1,000	35·62	14·67	29·93	26·15	24·28	29·19	28·71	39·05	..

The discharges by invaliding have been considerably under the average in all the arms except the Household Cavalry, and have been a little below the proportion in 1867 except in the Household Cavalry and Military Train. The detailed causes of invaliding will be found in Abstract No. 1 in the Appendix. The proportion invalided for tubercular diseases from the Household Cavalry and Foot Guards, was much higher than from any of the other arms.

Section III.

On the Number constantly Sick in Hospital of the Troops serving in the United Kingdom.

The usual information on this head for the Troops generally and for each arm of the Service is given in the following Table:—

		Troops generally.	Household Cavalry.	Cavalry of the Line.	Royal Artillery.	Military Train.	Foot Guards.	Infantry Regiments.	Depôt Brigade Royal Artillery.	Depôt Battalions.
Mean daily sick per 1,000 of strength ..	1868..	43·33	29·70	33·14	40·87	40·34	48·91	36·84	52·76	47·72
	1860-7	49·20	31·39	41·94	49·69	49·51	51·41	42·89	59·53	47·47
		Days.	Days.	Days.	Days.	Days.	Days.	Days.	Days.	Days.
Average sick time to each Man in the course of the Year	1868	15·82	10·84	13·92	14·92	14·72	17·85	13·45	19·26	17·42
	1860-7	17·96	15·31	15·31	18·14	18·07	18·77	15·65	21·73	17·33
Average duration of the Cases	1868	17·68	17·00	18·19	16·67	18·76	24·31	16·64	19·57	17·86
	1860-7	18·64	17·25	17·25	19·07	18·43	22·55	19·12	19·56	17·90

Compared with the results of the preceding year there has been a slight increase in the ratio constantly non-effective from sickness among the Troops generally, and in the average sick time to each man, and this has been the case also in all the arms except the Royal Artillery and the Infantry Regiments. There has been a reduction in the duration of the cases, however, among the Troops generally, and in the Household Cavalry, Royal Artillery, and Infantry Regiments.

Compared with the average of the last eight years the ratios for 1868 show very favourable results, as there has been a marked reduction in the mean

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daily sick and the average sick time to every soldier, in all except the Depôt Battalions. The Cavalry of the Line and the Military Train show a slight increase, and the Foot Guards one of nearly two days in the duration of the cases. The Royal Artillery and Infantry Regiments are the only two arms which show a marked decrease in this respect. The very close approximation of the results for the two periods in the Depôt Battalions is remarkable.

Section IV.

On the Influence of Age on the Mortality of Troops serving in the United Kingdom.

The following Table framed from Abstract No. 3 in the Appendix, shows the ratio of mortality at different ages in quinquennial periods in each arm of the Service :—

Corps.	Annual Ratio of Deaths per 1,000 Living, at the following Ages :—					
	Under 20.	20 and under 25.	25 and under 30.	30 and under 35.	35 and under 40.	40 and upwards.
Household Cavalry	7·94	18·87	6·71	..	9·01	8·69
Cavalry of the Line	3·38	5·82	5·55	15·12	18·44	8·81
Royal Artillery	3·24	6·83	12·36	15·67	26·14	22·06
Military Train	10·70	9·03	14·31	17·12	11·77	..
Foot Guards	0·93	4·50	6·04	8·55	9·15	..
Infantry Regiments	4·25	6·63	6·13	11·71	15·09	15·17
Depôt and Coast Brigades Royal Artillery, and Depôt Battalions	3·10	9·94	14·47	24·60	25·71	31·30
Ditto, ditto, 1859-67	5·32	8·91	11·68	16·63	23·48	28·68
Average of preceding, exclusive of all Depôts	3·68	6·65	7·28	12·77	17·32	12·49
Ditto, ditto, 1859-67	3·01	5·73	7·77	12·26	15·67	19·14
Civil Male Population { England and Wales	7·41	8·42	9·21	10·23	11·63	13·55
Civil Male Population { Healthy Districts	5·83	7·30	7·93	8·36	9·00	9·86

Compared with the results for 1867 this Table shows a decrease in the mortality of the Troops, exclusive of all Depôts, in the quinquennial period of life 30 and under 35, and also in the men above 40, but an increase at all the other periods. In the Depôts the increase is manifest at all the ages except under 20 years. As compared with the results of the last nine years there has been an increase in the ratios at all ages except under 20 in the Depôts, and from 25 to 30, and also above 40 in the other arms.

Section V.

On the Recruiting of the Army.

The Returns for the year 1868 show that 23,543 recruits were primarily inspected ; of these 8,869 were at the Head-Quarters of the Districts, 8,460 at Regiments and Depôts, and 6,214 by civil medical practitioners. The numbers rejected were 7,880 at primary and 967 at secondary inspection, making a total of 8,847, or 376 per 1,000 recruits, being only 2 per 1,000 less than in the preceding year.

The numbers rejected in each class of recruits are shown in the following Table :—

	Number of Recruits Primarily Inspected.	Number Rejected.			Ratio of Rejections per 1,000 Examined.	
		Primary Inspections.	Secondary Inspections.	Total.	Primary Inspections.	Primary and Secondary Inspections.
At Head-Quarters of Recruiting Districts	8,869	3,407	373	6,565	384·1	378·8
At Regiments and Depôts	8,460	2,785			329·2	
By Civil Medical Practitioners ..	6,214	1,688	594	2,282	271·6	367·2
Total	23,543	7,880	967	8,847	334·7	375·8

The proportion rejected very closely approximates that of 1867; there was a decrease of 12 per 1,000 in the rejections by Army Medical Officers, but this was counterbalanced by an increase in those of recruits examined by civil practitioners.

The following Table framed from Abstract No. 4 in the Appendix shows the numbers inspected and the proportion found unfit at each of the Recruiting Districts :—

Districts.	Total Number Inspected.		Ratio found Unfit per 1,000 Inspected.	
	Primary Inspections.	Secondary Inspections.	Primary Inspections.	Secondary Inspections.
London	4,458	1,963	373	94
Liverpool	1,676	688	404	177
Bristol	400	770	362	140
York	154	724	103	116
Glasgow	1,008	456	501	129
Dublin	681	204	381	98
Belfast	492	241	276	103
Total	8,869	5,046	384	119
Ratio in 1867	..	..	386	138

There has been a reduction in the proportion rejected on secondary inspection compared with the preceding year. The ratio of rejections on primary inspection was very high in Glasgow and very low in York, but in the latter district the number so inspected was very small. There was a marked reduction in the proportion rejected in the Belfast District compared with previous years.

The following Table shows the native countries of the recruits inspected, and the number rejected of each class :—

United Kingdom.

Native Countries of Recruits.	Head-Quarters of Recruiting Districts.		Head-Quarters of Regiments and Depôts.		By Civil Medical Practitioners.		Subsequently Rejected on Secondary Inspection.		Total.		Proportion Rejected per 1,000 Inspected.
	Inspected.	Rejected.	Inspected.	Rejected.	Inspected.	Rejected.	Of those who had been found fit by Army Surgeons.	Of those who had been found fit by Civilians.	Primarily Inspected.	Rejected at Primary and Secondary Inspections.	
England	5,714	2,146	6,088	1,975	4,841	1,323	258	457	16,643	6,159	370·0
Wales	83	37	179	58	138	58	6	26	450	185	411·1
Scotland	1,072	487	353	242	352	86	47	49	2,277	911	400·0
Ireland	1,937	718	1,227	476	816	220	61	60	3,980	1,535	385·6
British Colonies and Foreign Countries ...	63	19	113	34	17	1	1	2	193	57	295·3
Total ...	8,869	3,407	8,460	2,785	6,214	1,688	373	594	23,543	8,847	375·8

Compared with the results of the preceding year this Table shows an increase in the proportion rejected of the natives of Wales and Scotland, and to a very trifling extent also of England, but a decrease in the case of natives of Ireland and of the Colonies and Foreign Countries.

The proportion of the natives of each country in every 1,000 inspected was—

Of England and Wales	726
Scotland	96·7
Ireland	169·1
Colonies and Foreign Countries	8·2

There has been an increase in the proportion of English and decrease of Scotch recruits, while there has been a very trifling difference in that of Irish.

The numbers inspected for the different arms of the Service, and the numbers found unfit, are shown in following Table :—

	Head-Quarters of Recruiting Districts.		Regiments and Depôt Battalions.		Inspected by Civil Medical Practitioners.		Total Primary Inspections.		Rejected on Secondary Inspection.	Total.		Ratio of Rejections per 1,000
	Inspected.	Rejected.	Inspected.	Rejected.	Inspected.	Rejected.	Inspected.	Rejected.		Inspected.	Rejected.	
Household Cavalry	...	...	153	74	...	...	153	74	9	153	83	542·8
Cavalry of the Line and Military Train	1,307	426	536	160	183	38	2,026	624	34	2,026	658	324·8
Royal Artillery and Engineers	1,391	460	1,910	559	802	210	4,103	1,229	116	4,103	1,345	327·8
Foot Guards	61	23	159	57	686	185	906	265	144	906	409	451·4
Infantry Regiments and Depôts	6,110	2,498	5,702	1,935	4,543	1,255	16,355	5,688	664	16,355	6,352	388·4
Total	8,869	3,407	8,460	2,785	6,214	1,688	23,543	7,880	967	23,543	8,847	375·8

Compared with the preceding year there has been a very marked increase in the proportion rejected of recruits for the Household Cavalry and Foot Guards, and a very slight increase in those for Infantry Regiments, while there has been a decrease in those for Cavalry and the Ordnance Corps. As in 1867, the highest ratio of rejections occurred in the Household Cavalry, and the lowest in the Cavalry of the Line.

The disabilities for which the recruits were rejected at primary and secondary inspection respectively, are classified in the following Table :—

RETURN showing the Number of Recruits Rejected during the Year 1868, with the Causes arranged in Classes, and the Ratio per 1,000 in each Class.

Class.	Causes of Rejection, in Classes.	Primary Inspections.								Rejected on Secondary Inspection.		Total Rejected on both Primary and Secondary Inspection.					
		At Head-Quarters of Recruiting Districts.		At Head-Quarters of Regiments & Depôts.		By Civil Medical Practitioners.		Total.		Of Recruits previously examined by Army Medical Officers.	Of Recruits previously examined by Civilians.	Of Recruits examined by Army Medical Officers.		Of Recruits examined by Civil Medical Practitioners.		Total.	
		8,869		8,460		6,214		23,543				17,329		6,214		23,543	
		Number Rejected.	Ratio per 1,000.	Number Rejected.	Ratio per 1,000.	Number Rejected.	Ratio per 1,000.	Number Rejected.	Ratio per 1,000.			Number Rejected.	Ratio per 1,000.	Number Rejected.	Ratio per 1,000.	Number Rejected.	Ratio per 1,000.
1	Syphilis	75	8·46	115	13·59	87	14·00	277	11·77	11	15	201	11·60	102	16·41	303	12·88
2	Scrofula	76	8·57	69	8·16	21	3·38	166	7·05	3	8	148	8·54	29	4·67	177	7·52
3	Phthisis	63	7·10	98	11·58	37	5·95	198	8·41	13	11	174	10·04	48	7·72	222	9·43
4	Impaired Constitution	73	8·23	38	4·49	13	2·09	124	5·27	5	6	116	6·69	19	3·05	135	5·73
5	Muscular Tenuity and Debility	279	31·46	223	26·40	76	12·23	578	24·56	49	28	551	31·80	104	16·74	655	27·83
6	Other General Diseases	44	4·96	67	7·92	20	3·22	131	5·56	3	6	114	6·58	26	4·18	140	5·95
7	Diseases of the Nervous System	4	·45	6	·70	4	·64	14	·59	..	..	10	·57	4	·64	14	·59
8	Weakness of Intell ct	9	1·01	6	·70	6	·96	21	·89	3	9	18	1·03	15	·2·41	33	1·40
9	Diseases of Eyes and Eyelids	391	44·09	341	40·31	175	28·17	907	38·53	58	73	790	45·60	248	39·91	1,038	44·10
10	Diseases of Nose and Mouth	32	3·61	11	1·30	..	..	43	1·83	1	1	44	2·54	1	·16	45	1·91
11	Diseases of Ears	19	2·14	1	·11	..	..	20	·84	1	4	21	1·21	4	·64	25	1·06
12	Deafness	42	4·74	8	·95	2	·32	52	2·21	1	3	51	2·94	5	·80	56	2 38
13	Impediment of Speech	30	3·38	9	1·06	1	·16	40	1·70	8	11	47	2·71	12	1·93	59	2·50
14	Disease of Heart	271	30·56	197	23·30	109	17·54	577	24·51	40	44	508	29·32	153	24·62	661	28·10
15	Disease of Arteries (Aneurism)	1	·11	3	·35	..	..	4	·16	..	2	4	·23	2	·32	6	·25
16	Disease of Veins (Varix)	229	25·82	309	36·53	181	29·13	719	30·54	25	37	563	32·50	218	35·10	781	33·17

RETURN, &c.—*continued.*

Class.	Causes of Rejection, in Classes.	Primary Inspections.								Rejected on Secondary Inspection.		Total Rejected on both Primary and Secondary Inspection.					
		At Head-Quarters of Recruiting Districts.		At Head-Quarters of Regiments & Depôts.		By Civil Medical Practitioners.		Total.		Of Recruits previously examined by Army Medical Officers.	Of Recruits previously examined by Civilians.	Of Recruits examined by Army Medical Officers.		Of Recruits examined by Civil Medical Practitioners.		Total.	
		8,869		8,460		6,214		23,543				17,329		6,214		23,543	
		Number Rejected.	Ratio per 1,000.	Number Rejected.	Ratio per 1,000.	Number Rejected.	Ratio per 1,000.	Number Rejected.	Ratio per 1,000.			Number Rejected.	Ratio per 1,000.	Number Rejected.	Ratio per 1,000.	Number Rejected.	Ratio per 1,000.
17	Disease of Lungs (except Phthisis) ..	56	6·31	47	5·56	49	7·89	152	6·46	9	6	112	6·46	55	8·85	167	7·09
18	Loss or Decay of many Teeth	158	17·82	103	12·18	50	8·05	311	13·21	3	19	264	15·24	69	11·10	333	14·14
19	Hernia	136	15·34	91	10·76	139	22·37	366	15·55	8	30	235	13·56	169	27·20	404	17·16
20	Laxity of Abdominal Rings	80	9·02	43	5·08	43	6·92	166	7·05	9	16	132	7·61	59	9·49	191	8·11
21	Hæmorrhoids	42	4·74	6	·70	8	1·29	56	2·38	1	3	49	2·83	11	1·77	60	2·54
22	Diseases of the Urinary Organs	..	..	9	1·06	8	1·29	17	·72	..	..	9	·51	8	1·28	17	·72
23	Varicocele	173	19·51	165	19·50	165	26·56	503	21·40	17	18	355	20·50	183	29·45	538	22·85
24	Other Diseases of the Genital Organs (not Syphilitic)..	21	2·37	18	2·13	35	5·63	74	3·14	2	4	41	2·36	39	6·28	80	3·40
25	Defects of Upper Extremities, from Fracture, Contraction, Luxation, &c. ..	111	12·52	63	7·45	36	5·79	210	8·92	11	23	185	10·67	59	9·49	244	10·36
26	Defects of Lower Extremities, from Fracture, Contraction, Luxation, &c. ..	273	30·78	161	19·03	111	17·86	545	23·15	18	57	452	26·10	168	27·04	620	26·34
27	Flat Feet	85	9·58	69	8·16	33	5·31	187	7·94	13	29	167	9·66	62	9·98	229	9·73
28	Diseases of Joints	9	1·01	29	3·43	5	·80	43	1·83	3	6	41	2·36	11	1·77	52	2·21
29	Other Affections of Bones and Muscles ..	8	·90	17	2·00	21	3·38	46	1·95	2	1	27	1·55	22	3·54	49	2·08
30	Ulcers, Wounds, and Cicatrices	115	12·97	87	10·29	45	7·24	247	10·49	8	16	210	12·11	61	9·82	271	11·51

RETURN, &c.—*continued.*

Class.	Causes of Rejection, in Classes.	Primary Inspections.								Rejected on Secondary Inspection.		Total Rejected on both Primary and Secondary Inspection.					
		At Head-Quarters of Recruiting Districts.		At Head-Quarters of Regiments & Depôts.		By Civil Medical Practitioners.		Total.				Of Recruits examined by Army Medical Officers.		Of Recruits examined by Civil Medical Practitioners.		Total.	
		8,869		8,460		6,214		23,543				17,329		6,214		23,543	
		Number Rejected.	Ratio per 1,000.	Number Rejected.	Ratio per 1,000.	Number Rejected.	Ratio per 1,000.	Number Rejected.	Ratio per 1,000.	Of Recruits previously examined by Army Medical Officers.	Of Recruits previously examined by Civilians.	Number Rejected.	Ratio per 1,000.	Number Rejected.	Ratio per 1,000.	Number Rejected.	Ratio per 1,000.
31	Other Affections of the Cutaneous System.	54	6·08	28	3·31	48	7·72	130	5·52	3	5	85	4·90	53	8·53	138	5·86
32	Malformation of Ears	..	..	1	·11	..	..	1	·04	..	..	1	·05	..	..	1	·04
33	„ Nose and Mouth.. ..	9	1·01	2	·23	..	..	11	·46	2	1	13	·75	1	·16	14	·59
34	„ Chest and Spine	267	30·11	221	26·12	122	19·64	610	25·91	23	58	511	29·50	180	29·00	691	29·36
35	„ Urinary and Genital Organs	1	·11	9	1·06	1	·16	11	·46	..	1	10	·57	2	·32	12	·50
36	Marks of Punishment or letters D or B C..	20	2·25	13	1·54	3	·48	36	1·53	1	1	34	1·96	4	·64	38	1·61
37	Marks of Cupping, Blistering, &c... ..	151	17·03	100	11·82	34	5·47	285	12·10	19	42	270	15·58	76	12·23	346	14·70
38	Not specified	..	..	2	·23	..	..	2	·08	..	..	2	·11	..	..	2	·08
	Total	3407	384·15	2785	329·20	1688	271·64	7,880	334·71	373	594	6565	378·84	2282	367·24	8,847	375·78

United Kingdom.

This Table shows the most frequent cause of rejection to have been diseases of the eyes and eyelids, and after it varicose veins, malformation of chest and spine, disease of heart, muscular tenuity and debility, and defects of lower extremities. These six groups of disabilities were the cause of one-half of the rejections. The classification of the disabilities has been somewhat altered so as to bring it into accord with the new nomenclature of diseases prepared by the Royal College of Physicians, and a perfectly accurate comparison with the results of the preceding year cannot consequently be made; but from a careful examination of the returns there appears to have been a decrease in the proportions rejected for syphilis, defects of lower extremities, ulcers, wounds and cicatrices, and marks of cupping or blistering, while there was an increase in phthisis, impediment of speech, and disease of heart. An increase in the cases of hernia was compensated by a reduction in those of laxity of the abdominal rings.

The ages of the recruits inspected are shown in the following Table, framed from Abstract No. 6 in the Appendix :—

Proportion in 10,000 Examined.	Boys under 17.	17 to 18.	18 to 19.	19 to 20.	20 to 21.	21 to 22.	22 to 23.	23 to 24.	24 to 25.	25 and upwards.
At Head Quarters Recruiting Districts ..	155	683	2,580	1,732	1,379	1008	984	741	549	189
At Regiments and Depôts ..	589	1573	2,525	1,495	1,068	872	708	583	404	183
By Civil Medical Practioners	67	732	2,601	1,815	1,302	1036	900	723	748	76
Total ..	287	1016	2,566	1,669	1,247	967	863	679	549	157

There was an increase compared with the proportion in 1867 in the lads under 18 and in the men of 19 to 20 and 22 to 24, and a decrease in the proportion at the age of 18 to 19 and above 24, while from 20 to 22 the results in the two years closely correspond.

The following Table shows the proportion of recruits at each height, the numbers will be found in Abstract No. 7 in the Appendix :—

Proportion in 10,000.	Inspected at Head-Quarters Recruiting Districts.	Inspected at Regiments and Depôts.	Inspected by Civil Medical Practitioners.	Total.
Ft. In. Ft. In.				
Under 5 3 ..	166	495	74	260
5 3 to 5 4 ..	89	241	4	122
5 4 „ 5 5 ..	417	886	119	507
5 5 „ 5 6 ..	1,135	1,974	425	1,268
5 6 „ 5 7 ..	2,572	2,128	3,137	2,561
5 7 „ 5 8 ..	2,745	1,792	2,771	2,409
5 8 „ 5 9 ..	1,554	1,272	1,730	1,499
5 9 „ 5 10 ..	713	630	975	752
5 10 „ 5 11 ..	383	279	448	363
5 11 „ 6 0 ..	134	165	224	169
6 0 and upwards	42	138	93	90

Compared with the results for 1867, there has been an increase in the proportion at 5 ft. 7 in., and all the heights above it, and also in boys under 5 ft. 3 in., while there has been a marked decrease in the men from 5 ft. 5 in. to 5 ft. 6 in. This decrease has been caused by the standard for all corps, except the Artillery and Engineer drivers, having been raised to 5 ft. 6 in. in February. Men under that height could therefore only be entitled by special authority.

The following Table, framed from Abstract No. 8 in the Appendix, shows the weights of the recruits inspected at the Head-Quarters of the Districts.

No information on this head is available as regards the other two classes of recruits.

lbs.		lbs.		
Under 100			.. ..	153
From 100	to	110	.. ..	489
„ 110	to	120	.. ..	1,477
„ 120	to	130	.. ..	3,162
„ 130	to	140	.. ..	2,318
„ 140	to	150	.. ..	1,454
„ 150	to	160	.. ..	685
„ 160	to	170	.. ..	220
„ 170 and upwards			.. ..	42
				10,000

There has been a considerable decrease compared with the preceding year in the men from 110 to 120 lbs. weight, and an increase in the three groups above 150 lbs. Under 100 lbs. there has been a decrease, but it has been counterbalanced by an increase to the same extent in the next group, from 100 to 110 lbs.

The following Table shows the state of education among the recruits inspected during the year at the Head-Quarters of the Recruiting Districts, and at Regiments and Depôts. The numbers will be found in Abstract No. 9 in the Appendix :—

Of every 1,000 Recruits Examined.	Unable to Read or Write.	Able to Read only.	Able to Read and Write.
At Head-Quarters of Recruiting Districts	275	77	648
At Regiments and Depôts	132	115	753
Total	205	96	699

Compared with the results for 1867 this Table shows a reduction in the proportion wholly uneducated and in those able to read only, and consequently an increase in the proportion able to read and write. The improvement has been shown exclusively in the men examined at Regiments and Depôts.

The occupations of the recruits inspected, and the rejections in each class of occupation, were as follows :—

Occupations of Recruits.	Number Inspected.	Rejected on Primary Inspection.	Rejected on Secondary Inspection.	Total Rejected.	Ratio per 1,000 Rejected.
1. Labourers, Husbandmen, and Servants	13,470	4,471	580	5,051	374·9
2. Manufacturing Artisans (as Clothworkers, Weavers, Lace Makers, &c.)	3,285	1,141	132	1,273	387·5
3. Mechanics employed in Occupations favourable to physical development (as Carpenters, Smiths, Masons, &c.)	4,373	1,619	192	1,811	414·1
4. Shopmen and Clerks	1,664	533	46	579	347·9
5. Professional Occupations, Students	199	60	4	64	321·6
6. Boys	552	56	13	69	123·2
Total	23,543	7,880	967	8,847	375·7

United Kingdom.

This Table shows an increase in the proportion rejected of labourers, manufacturing artisans, men of professional occupations, and boys; the increase being greatest in professional occupations; and a decrease in the proportion rejected of mechanics employed in occupations favourable to physical development, and of shopmen and clerks; but the ratio continues lowest (excepting the boys) in the class following professional occupations.

The proportion of recruits furnished by each group of occupations was as follows:—

1. Labourers, Husbandmen, and Servants	572·2
2. Manufacturing Artizans (as Clothworkers, Weavers, Lace-makers, &c.)	139·5
3. Mechanics employed in occupations favourable to physical development (as Carpenters, Smiths, Masons, &c.) ..	185·8
4. Shopmen and Clerks	70·7
5. Professional occupations, Students	8·4
6. Boys	23·4
Total	1000·0

Compared with 1867 there has been an increase in the proportion enlisted of mechanics employed in occupations favourable to physical development, of shopmen and clerks, and of boys; and a decrease in the proportion of labourers and manufacturing artisans.

II.—ON THE HEALTH OF THE TROOPS SERVING IN THE MEDITERRANEAN.

Section I.—Sickness and Mortality.

I.—Gibraltar.

STATISTICAL REPORT.

Gibraltar.

In February, the 87th Regiment proceeded to Malta, on being relieved by the 74th from England. In June, the 1st Battery 1st Brigade Royal Artillery left Gibraltar for Australia; and in October the 75th Regiment left for China, and the 2nd Battalion 15th Regiment for England, being replaced by the 28th and 71st Regiments from home.

The average strength of the Troops during the year was 4,631; the admissions into hospital were 3,746, and the deaths 39, of which 28 occurred in hospital, 6 out of hospital, and 5 among the invalids sent to England. These numbers give the proportion of 809 admissions, and 8·43 deaths per 1,000 of mean strength—both in excess of the ratio of the preceding year.

The admissions and deaths in each of the corps serving in the Garrison, were as follows:—

Corps.	Average Annual Strength.	Admitted into Hospital.	Died.				Ratio per 1,000.	
			In Hospital.	Out of Hospital.	Of Invalids.	Total.	Admitted.	Died.
Royal Artillery	699	697	3	..	1	4	977	5·72
Royal Engineers	274	274	1	1	..	2	1000	7·30
1st Battalion 13th Regiment ..	732	381	4	2	..	6	520	8·20
2nd „ 15th „ ..	533	365	3	..	1	4	685	7·50
28th Regiment	187	138	2	1	..	3	738	16·04
71st „	123	102	..	..	..	..	829	..
74th „	676	538	5	2	1	8	796	11·83
75th „	578	682	7	..	..	7	1180	12·11
83rd „	731	487	2	..	1	3	666	4·10
87th „	82	31	..	..	1	1	378	12·19

The admissions were considerably in excess in the 75th Regiment, chiefly from cases of fever; but it must be remembered that this corps left the Garrison in the beginning of October, the period when a reduction in the number of admissions usually takes place.

The following Table, framed from Abstract No. 10 in the Appendix, shows the influence of the various classes of diseases in causing sickness and mortality in this Command:—

Gibraltar.

Orders.	Diseases.	1868. Average Strength, 4,631. Admitted into Hospital.	Deaths. At Gibraltar.	Deaths. Of Invalids.	Total Died.	Annual ratio per 1,000 of Strength. Admitted.	Annual ratio per 1,000 of Strength. Died.	1859-67. Annual ratio per 1,000 of Strength. Admitted.	1859-67. Annual ratio per 1,000 of Strength. Died.	1868. Infantry at Home. Annual ratio per 1,000 of Strength. Admitted	1868. Infantry at Home. Annual ratio per 1,000 of Strength. Died.
	Class I.										
1	Miasmatic Diseases ..	975	5	..	5	210·5	1·08	244·8	4·70	157·0	·79
2	Enthetic „ ..	1,041	1	1	2	224·8	·43	184·6	..	249·1	..
3	Dietic „ ..	103	..	..	..	22·2	..	12·7	·11	10·1	·08
4	Parasitic „ ..	30	..	..	..	6·5	..	7·0	..	33·2	..
	Class II.										
1	Diathetic Diseases ..	23	..	..	..	5·0	..	3·8	·11	5·8	·08
2	Tubercular „ ..	63	4	3	7	13·6	1·52	8·3	1·23	13·0	2·06
	Class III. Diseases of the—										
1	Nervous System ..	92	6	..	6	19·9	1·29	17·2	·35	17·9	·68
2	Circulatory „ ..	22	5	1	6	4·8	1·29	6·7	·76	8·5	1·85
3	Respiratory „ ..	164	3	..	3	35·4	·65	48·8	·44	66·4	·79
4	Digestive „ ..	257	3	..	3	55·5	·65	35·3	·28	33·6	·71
5	Urinary „ ..	8	1	..	1	1·7	·22	2·4	·17	2·6	·20
6	Reproductive „ ..	91	..	..	..	19·7	..	16·1	..	10·9	..
7	Locomotive „ ..	14	..	..	..	3·0	..	4·2	·06	5·0	..
8	Integumentary „ ..	473	..	..	..	102·1	..	114·6	..	106·4	..
	Class IV.										
4	Diseases of Nutrition	26	..	..	..	5·6	..	2·4	·02	4·9	·04
	Class V.										
1	Accidents	358	3	..	3	77·3	·65	75·0	·41	82·8	·83
3	Homicide	..	..	..	..	..	..	..	·06	..	·20
4	Suicide	2	3	..	3	·4	·65	·2	·30	·2	·16
5	Execution	..	..	..	..	..	..	..	·06	..	..
6	Corporal Punishment	3	..	..	..	·7	..	2·7	..	·2	..
	Diseases not stated ..	..	..	..	..	..	..	1·6	..	..	..
	No appreciable Disease	1	..	..	..	·2	..	·6	..	·4	..
	Total	3,746	34	5	39	808·9	8·43	789·0	9·06	808·0	7·97

The admissions have been 20 per 1,000 above the average of the preceding nine years. The excess has been chiefly in venereal diseases. The deaths have been under the average; the reduction being in those by the class of miasmatic diseases.

The sickness has been the same as, but the mortality higher than, among the Infantry at home in the same year. Miasmatic diseases were considerably more prevalent at Gibraltar, while enthetic diseases and those of the respiratory system were more prevalent at home. The excess of the mortality at Gibraltar was caused by miasmatic diseases, but the ratio of deaths by tubercular diseases and those of the circulatory system was lower than in the Infantry in the United Kingdom.

Misasmatic Diseases when subdivided gave the following results :—

Miasmatic Diseases.	Admitted.	Died.	Annual ratio per 1,000. 1868. Admitted.	1868. Died.	1859–67. Admitted.	1859–67. Died.
Eruptive Fevers	1	..	·2	..	1·5	·11
Paroxysmal „	15	..	3·3	..	5·1	·09
Continued „	302	4	65·2	·86	78·3	1·90
Dysentery and Diarrhœa	74	1	16·0	·22	52·3	·91
Spasmodic Cholera	..	..	..	..	2·6	1·64
Sorethroat and Influenza	146	..	31·5	..	20·6	..
Ophthalmia..	159	..	34·3	..	39·9	..
Rheumatism	253	..	54·6	..	34·7	..

The admissions by sorethroat and influenza, and by rheumatism, were above the average, but by all the other diseases they were below it, the reduction being most marked in the cases of dysentery and diarrhœa.

Compared with the results for 1867 there has been a decrease in eruptive and continued fevers, and in dysentery and diarrhœa, and an increase in all the other diseases.

Continued Fevers were less prevalent than in 1867, and were considerably under the average. The reduction in their amount would have been much more marked but for the occurrence of a large number of cases in the 75th Regiment, which had 125 admissions by this form of fever in the nine months during which it formed part of the Garrison. The medical officer in charge attributed their prevalence to the defective construction of the Wellington Front and King's Bastion Barracks occupied by the regiment, and their immediate proximity to the outfall of the sewage and drainage of the town into the harbour. The Royal Artillery was the only other Corps which suffered to any extent; it furnished 70 admissions. The medical officer in charge assigns as the principal cause of the disease the defective construction and unfavourable position of Lumps Bastion, Prince Albert's Front, and Orange Bastion, quarters occupied by a portion of the Corps.

Dysentery and Diarrhœa were not more than half as prevalent as in 1867, and presented a still more favourable contrast with the average of the last nine years.

Sorethroat and Influenza furnished considerably more than the average proportion of admissions, but their prevalence was not specially marked in any Corps.

Ophthalmia.—The ratio of admissions, though under the average of the last nine years, was higher than in 1867. The increase was confined to the 2nd Battalion 15th Regiment, which had 60 admissions, and it may be remembered that the Corps suffered from it to a great extent when serving in Malta in 1861–2.

Rheumatism was greatly above the average, but the excess occurred chiefly in the Royal Artillery, 75th, and 74th Regiments. The first two of these Corps furnished the largest number of cases of fever in the garrison, and the Medical Officer in charge of the Royal Artillery states that three-fourths of the cases of rheumatism were the result of attacks of fever, and that they were of a most obstinate and intractable character. This may probably have been the cause also of the large number of cases in the 75th Regiment. The Medical Officer of the 74th Regiment makes no remark on the amount of rheumatism in that Corps, but it may not unlikely have been intimately connected with the amount of venereal disease from which it suffered in Dublin previous to its embarkation for Gibraltar.

ENTHETIC DISEASES show an increase of 10 per 1,000 upon the amount in 1867, the difference being in cases of gonorrhœa. The excess occurred chiefly in the Royal Artillery, the 74th, and the 83rd Regiments; the 28th and 71st Regiments also during the short time they were in the garrison furnished a disproportionately large number of cases.

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VIOLENT DEATHS.—Of these three were accidental, one by drowning, and two by falls over cliffs, and three were suicidal, a serjeant of the 28th Regiment poisoned himself with opium, a private of the 74th shot himself in his barrack-room, and a sapper of the Royal Engineers while a patient in hospital for an incipient attack of *Delirium Tremens*, threw himself off the cliff outside the Naval Hospital.

SANITARY REPORT.

Deputy Inspector-General Rutherford, C.B., reports :—

"I gather from the Reports of the Medical Officers in charge of regiments and detachments, that overcrowding to a greater or less extent in some of the barracks, deficient ventilation, defective drainage, and the occupation of casemates in low and insanitary situations, and intemperance, have added their quota to the causes of diseases during the past year. Fever of a typhoid character prevailed to a considerable extent among the men of the 75th Regiment stationed in the "Wellington Front Casemates" during the autumn ; to check which it was considered necessary to remove a large detachment of the corps to Europa. This measure was carried out with very satisfactory results.

Much has been, and is being done to remedy the above insanitary conditions, although the position of many of these casemates militate much against the ultimate good results hoped for in a sanitary point of view. A very considerable time, probably, will elapse before all the recommendations made by the Barrack and Hospital Improvement Commission are fully carried out.

The very radical and extensive new drainage works of the whole town and garrison, undertaken by the Gibraltar Sanitary Commissioners, are being rapidly carried on, and a portion of the scheme is said to be in satisfactory working order.

The plan may be considered as similar in principle to the great London system of drainage, and it may not perhaps be premature to augur the best results from it when completed and in full operation.

The following are the sanitary services executed during the year, as obtained from the office of the Commanding Royal Engineer :—

Service.	*Remarks.*
Wellington Front: providing new pattern Jenning's latrines, tanks, and out-fall of 9-inch pipes to the sea.	Delayed very much for want of Stores, without which the work cannot be completed. The iron pipes are still required.
Naval Hospital: completing water-closets, baths, and lavatories at north-east end of hospital. Fire-places and ventilation to orderlies rooms, superintendent and nurses rooms. Salt-water to latrines.	These services will be completed before the end of March ; they have been very much delayed for want of stores.
Town Range Barracks: Improvements to, and providing Jenning's latrines, and drainage.	Good progress has been made in this service. Will be completed before the end of March. Want of stores sole cause of delay.
Brewery Barracks: provide three water-closets for officers, 3 Jenning's latrines and urinals for servants, and put up urinals and cisterns for flushing at soldiers' barracks.	This service will be completed by the end of March. Fitments only lately received from England.
Fuze House Barracks: provide 2 latrines and 250 gallon tank.	Service nearly completed.
Defensible Barracks: lay on salt-water for flushing.	Ditto ditto

Service.	*Remarks.*
Moorish Castle: re-building and enlarging soldiers' latrine and urinal, and fitting up women's latrine, and laying 9-inch drain pipe to main sewer.	This service, very much delayed for want of stores, will be completed by the end of March.
Gunners' barracks: fixing latrines and urinals (Jenning's), and improvements, &c.	Service completed.
Retrenchment Mess and Engineer Officers' Quarters: provide water-closets in lieu of existing privies.	Service completed.
Catalan Bay: drainage improvements to outfall, flushing tank provided, and yard of barracks paved.	Ditto.
Grand Casemates: ablution and bath rooms fitted up. Soldiers' latrines improved with Jenning's fitments, main drainage of barracks re-modelled, and branch drains constructed.	Work nearly finished, delayed on account of the main drainage in this locality to be constructed by the Sanitary Commissioners not having been completed.
Main Guard: men's rooms enlarged, boarded, and ventilation provided. New pattern latrines and urinals, yard tar-paved.	Work nearly completed.
Moorish Castle Guard: a lock-up provided, well ventilated and floored.	Service completed.
Orange Bastion Guard: lock-up enlarged, ventilated, and floored, and roof raised.	Ditto.
Europa Advanced Guard: wooden floor, new grate, new guard bed, sashes glazed.	Dito.
Rosia Artillery Barracks: cook-house, sink and surface drain provided.	Ditto.
Royal Engineers: lock-up at Hargrave's Barracks enlarged and improved.	Ditto.
North-East Front Guard-Room: wooden floor, ventilating grate, new latrines, with flushing.	Ditto.
South Barrack Guard: provided with ventilating shaft.	Ditto.

A considerable sum of money has also been expended in drainage and branch drains in the different barracks along the new line of drainage constructed by the Sanitary Commissioners, and other improvements have been obliged to be made in compliance with the Sanitary Order in Council, amongst which are:—

Southport Guard: converted privy to water latrine, and 6-inch drain pipes laid.

Town Range Barracks: the whole surface drainage improved with new 6-inch pipes, drainage from guard-rooms, cook-houses, stables, latrines connected, all cess-pit openings trapped.

Gunners' Barracks: drainage improved, and traps for all drain gratings provided.

Convent Guard: surface drainage improved, and traps to drains provided.

It is to be observed, in addition to the above, that the drainage of several officers' quarters in Southport Street, the Commissariat stables and offices in Queen Street, has been examined and improved. Privies converted to water-closets, drain gratings and traps have been provided; and works of this nature will have to be undertaken whenever required in the different

Gibraltar.

barracks, &c., to meet the expense of which a sum of money has been provided in next year's estimates.

The issue of salt pork as a ration has been limited throughout the year to one day each week.

Red serge tunics, instead of white, were taken into use by the Royal Engineers during the hot months, and, I think, advantage in a hygienic point of view would probably result to the men of the Royal Artillery, should a similar material be adopted by them.

Alterations and improvements are still being carried out in the Garrison (Naval) Hospital, in which there is more than ample space for all the wants of the force. Every bed has more than the regulated space of 1,200 cubic feet, and every occupied bed very considerably more, leaving some wards altogether vacant.

The great dearth of separate married accommodation alluded to in last Annual Report continues, although some improvements in this way are being gradually introduced. This scarcity is more urgent in the corps occupying "the Town Range" and "South Barracks," where, excepting for some non-commissioned officers, scarcely any separate accommodation whatever exists. Even the present accommodation in the localities indicated is of a most objectionable character; as an example of which, it may be mentioned that no fewer than 30 families are sheltered in one large apartment or room in Rosia Wooden Shed, which however is lofty, and has the additional advantage of being provided to a greater or less extent with means of cross ventilation. It is in contemplation to ease this pressure by converting the lower storey of this building into married quarters."

II.—Malta.

Statistical Report.

In February, the 87th Regiment from Gibraltar relieved the 2nd Battalion 8th, which returned home. In October, the 52nd and 87th Regiments arrived from England, and the 1st Battalions of the 14th and 8th Regiments proceeded to India.

The average strength of the troops, exclusive of the Royal Malta Fencible Artillery, was 5,377; the admissions into hospital were 4,597, and the deaths 102, including 6 of invalids in England, while awaiting their discharge. Thirteen of the deaths occurred out of hospital. These numbers give the proportion of 855 admissions and 18·97 deaths per 1,000 of mean strength; the former being slightly and the latter one-fourth under the ratio in the preceding year.

The admissions into hospital and deaths in each Corps during the year were as follows:—

Corps.	Average Annual Strength.	Admitted into Hospital.	Died.				Ratio per 1,000 of Strength.	
			In Hospital.	Out of Hospital.	Of Invalids.	Total.	Admitted.	Died.
Royal Artillery	785	1,077	14	8	3	25	1,372	31·85
Royal Engineers	180	154	2	..	..	2	856	11·11
1st Battalion 8th Regiment ..	568	583	4	..	1	5	1,026	8·80
2nd „ „ „ ..	76	44	1	..	..	1	579	13·16
1st „ 14th „ ..	593	404	5	..	..	5	681	8·43
„ „ 24th „ ..	691	476	19	..	1	20	689	28·94
31st Regiment	729	467	7	1	..	8	641	10·97
48th „	149	166	3	..	..	3	1,114	20·13
52nd „	180	283	4	..	..	4	1,724	22·22
64th „	717	565	14	3	1	18	788	25·10
87th „	635	358	7	1	..	8	564	12·66

Malta.

The other three deaths were of men of the Army Hospital Corps.

The Royal Artillery furnished a very high ratio of admissions and the highest ratio of deaths. The admissions were also much above the average in the 1st Battalion 8th, the 48th, and 52nd Regiments, but none of these Corps were in the command during the whole of the year. The 1st battalion 24th and the 61th Regiments had an extremely high death rate.

The influence of the different classes of diseases in causing sickness and mortality is shown in the following Table. The details for 1868 will be found in Abstract No. 10 in the Appendix.

Orders.	Diseases.	1868.—Strength, 5,377.						1859–67.	
		Admitted into Hospital.	Deaths.		Total Died.	Annual ratio per 1,000 of Strength.		Annual ratio per 1,000 of Strength.	
			In Malta.	Of Invalids.		Admitted.	Died.	Admitted.	Died.
	Class I.								
1	Miasmatic Diseases..	2,178	38	..	38	405·1	7·07	410·0	6·96
2	Enthetic „ ..	378	..	..	..	70·3	..	79·0	..
3	Dietic „ ..	132	2	..	2	24·5	·37	13·8	·18
4	Parasitic „ ..	45	..	..	..	8·4	..	11·1	..
	Class II.								
1	Diathetic Diseases..	25	2	1	3	4·7	·56	4·6	·12
2	Tubercular „ ..	61	10	4	14	11·3	2·60	10·4	1·80
	Class III. Diseases of the—								
1	Nervous System ..	81	5	..	5	15·1	·93	18·0	·54
2	Circulatory „ ..	61	8	..	8	11·3	1·49	8·4	·84
3	Respiratory „ ..	212	6	..	6	39·4	1·12	45·0	·77
4	Digestive „ ..	265	8	1	9	49·3	1·67	46·7	·69
5	Urinary „ ..	12	..	..	..	2·2	..	2·2	·22
6	Reproductive „ ..	61	..	..	..	11·3	..	12·7	..
7	Locomotive „ ..	15	..	..	..	2·8	..	4·9	..
8	Integumentary „ ..	625	..	..	..	116·2	..	127·3	·03
	Class IV.								
4	Diseases of Nutrition.	16	..	..	..	3·0	..	5·1	·06
	Class V.								
1	Accidents	423	14	..	14	78·7	2·60	81·9	1·25
3	Homicide	..	..	..	..	..	..	..	·02
4	Suicide	1	3	..	3	·2	·56	·1	·34
5	Execution	..	..	..	..	..	..	..	·03
6	Corporal Punishment	..	..	..	..	..	..	2·4	..
	No appreciable disease	6	..	..	..	1·1	..	·2	..
	Diseases not stated ..	..	..	..	..	..	..	1·3	..
	Total	4,597	96	6	102	854·9	18·97	885·1	13·85

The admissions have been under the average of the preceding nine years, but the deaths have exceeded it by 5·12 per 1,000; the latter have, however, been 5·22 under the proportion in the preceding year. The excess of the mortality over the average and the reduction in it compared with the results for 1867 were chiefly in miasmatic diseases.

Miasmatic Diseases were considerably less prevalent than in 1867, and slightly under the average of the last nine years. When subdivided they furnish the following results:—

Malta.

Diseases.	1868. Admitted.	1868. Died.	Annual Ratio per 1,000 of Strength. 1868. Admitted.	1868. Died.	1859-67. Admitted.	1859-67. Died.
Eruptive Fevers	3	..	·6	..	1·4	·08
Paroxysmal „	24	..	4·5	..	4·2	·02
Continued „	1,106	34	205·7	6·32	186·8	3·86
Dysentery and Diarrhœa	453	3	84·2	·56	70·4	·73
Spasmodic Cholera	..	..	..	..	2·9	2·14
Sorethroat and Influenza	142	..	26·4	..	15·0	..
Ophthalmia	154	..	28·6	..	71·4	..
Rheumatism	240	..	44·6	..	49·5	·04

Continued Fevers were the cause of more than half the admissions and of nearly all the deaths by this class of diseases. Though less prevalent than in 1867 the admissions were above and the deaths nearly double the average. They began to increase in amount in May, but the great excess was chiefly from June to September inclusive. The following Table shows the strength of each of the Corps serving in Malta on the 1st of June, and the admissions and deaths by continued fever in that and the three following months :—

	Strength on 1st June.	June to September, Continued Fevers. Admissions.	Deaths.	Quarters occupied during Period.
Royal Artillery	798	269	5	Upper St. Elmo, Forts St. Salvatore, St. Angelo, Tigné, Ricasoli, St James's Cavalier, and Marsamuscetto.
„ Engineers	180	23	..	St. Francis Barracks and Ravelin.
1st Bn. 8th Regt.	773	98	..	Lower St. Elmo.
„ 14th „	758	31	1	Pembroke Camp.
„ 24th „	700	105	5	Floriana Barracks.
31st Regiment	757	38	3	Isola Gate, Polverista, &c.
64th „	732	103	2	Fort Ricasoli, Zabbar Gate, &c.
87th „	753	67	..	Verdala Barracks.

The Royal Artillery furnished much the highest proportion of cases, the admissions during the four months having been equal to one-third of the strength, and more than double the proportion in any other Corps. The Regiments which come next as regards the prevalence of fever were the 24th in Floriana Barracks, the 64th at Fort Ricasoli, the Royal Engineers at St. Francis Barracks, and the 1st Battalion 8th Regiment at Lower St. Elmo. Those which suffered least were the 87th in Verdala Barracks, the 31st at Isola Gate, Polverista, &c., and the 1st Battalion 14th Regiment at Pembroke Camp. The Medical Officer in charge of the Artillery attributes the great amount of fever at Fort St. Elmo to the vicinity of the opening of extensive town sewers close to the Fort, the barracks being in a greater or less degree, according to the direction of the wind, subject to the influence of an atmosphere loaded with sewage effluvia producing the natural results—continued and typhoid fevers.

In the middle of July, owing to the great increase of fever in the Royal Artillery, the employment of the men in lacquering shot and guns and in unloading barges for the Store Department, when they were unduly exposed

to the sun, was discontinued with marked benefit. About the same time the numbers in the barrack-rooms were reduced by a certain proportion of the men occupying tents at night. *Malta.*

Dysentery and Diarrhœa were above the average. The Royal Artillery furnished the highest proportion of cases, and next to it the 64th, 87th, and 52nd Regiments, while the Royal Engineers and 1st Battalion 14th Regiment were remarkably exempt from them.

Sorethroat and Influenza were more prevalent than usual, but did not effect any Corps to a great extent; the 1st Battalion 8th Regiment had the highest ratio of cases.

Ophthalmia was only half as prevalent as in 1867; the only Regiment in which it prevailed to any extent was the 14th, which had 41 cases, but no reason has been assigned for the greater proportion in this compared with the other Corps in the Command.

ENTHETIC DISEASES, though under the average of the last nine years were more prevalent than in 1867. The 48th and 52nd, 24th, and Royal Artillery, furnished the greatest proportion of cases, but in none was the amount excessive.

In none of the other classes did the admissions differ so much from the average or from the proportion in 1867 as to call for special remark. The deaths by ACCIDENTS AND VIOLENCE were more than double the average. This was due to the occurrence of ten by this class in the Royal Artillery. Six of these were caused by the explosion of an expense magazine at Fort St. Angelo, one was killed by the sheers falling upon him while engaged in lowering a gun into a ditch, one by a gun-carriage falling upon him and fracturing his pelvis, one was accidentally drowned, and one committed suicide with his rifle. Of the other seven deaths three were caused by fracture of the skull, one by sunstroke, one by drowning, and two were suicidal by cut-throat, one of the men being at the time in the Military Prison, and the other a patient in hospital about to be invalided to England on account of mental derangement.

ROYAL MALTA FENCIBLE ARTILLERY.

The average strength of this Corps during the year was 593; the admissions into hospital amounted to 485, and the deaths to 7, being respectively in the ratio of 818 and 11·81 per 1,000 of the strength, both considerably higher than in 1867 but a little below the average of the last nine years.

The diseases by which the admissions and deaths were caused are stated in Abstract No. 10 in the Appendix, from which the following Table has been framed:—

Malta.

Orders.	Diseases.	Royal Malta Fencible Artillery. Average Strength. 533		Annual Ratio per 1,000. 1868.		Annual Ratio per 1,000. 1859–67.		Annual Ratio per 1,000 of Strength. Line Regiments at Malta. 1868.	
		Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
	Class I.								
1	Miasmatic Diseases	192	2	323·8	3·37	281·5	2·05	405·1	7·07
2	Enthetic „	45	..	75·9	..	63·0	..	70·3	..
3	Dietic „	1	..	1·7	..	·5	..	24·5	·37
4	Parasitic „	1	..	1·7	..	2·7	..	8·4	..
	Class II.								
1	Diathetic Diseases	..	..	..	..	2·4	·18	4·7	·56
2	Tubercular „	5	1	8·4	1·69	4·1	1·49	11·3	2·60
	Class III.								
	Diseases of the—								
1	Nervous System	27	1	45·5	1·69	13·2	·93	15·1	·93
2	Circulatory „	..	1	..	1·69	2·6	·75	11·3	1·49
3	Respiratory „	43	..	72·5	..	73·8	·37	39·4	1·12
4	Digestive „	45	2	75·9	3·37	156·2	1·30	49·3	1·67
5	Urinary „	3	..	5·1	..	1·7	..	2·2	..
6	Reproductive „	4	..	6·7	..	2·4	..	11·3	..
7	Locomotive „	..	..	..	..	..	..	2·8	..
8	Integumentary „	86	..	145·0	..	135·4	..	116·2	..
	Class IV.								
4	Diseases of Nutrition ..	..	..	..	..	..	..	3·0	..
	Class V.								
1	Accidents	33	..	55·7	..	81·2	·93	78·7	2·60
3	Homicide	..	..	..	..	·1	·37	·2	·56
4	Suicide	..	..	..	..	·3	..	..	..
6	Corporal Punishment ..	..	..	..	..	·7	..	..	..
	No appreciable disease ..	..	..	..	..	..	..	1·1	..
	Total	485	7	817·9	11·81	821·8	8·37	854·9	18·97

The admissions and deaths have been much higher than in 1867. The increase in the former has taken place in all the classes except diseases of the circulatory and digestive systems and accidents, but has been most marked in miasmatic diseases and those of the nervous and integumentary systems.

Compared with the results for the last nine years there has been an increase in miasmatic and enthetic diseases, and in those of the nervous and integumentary systems, but a decrease in diseases of the digestive system and in accidents.

The excess in the admissions by miasmatic diseases over those in 1867 was caused chiefly by sorethroat, ophthalmia, and continued fever; in enthetic diseases by gonorrhœa; in diseases of the nervous system by amentia and epileptiform convulsions; in those of the respiratory system by bronchitis; and of the integumentary system by abscesses; but there was nothing connected with the prevalence of any of these to call for special comment. There was a considerable reduction in the number of cases of dyspepsia.

SANITARY REPORT.

Malta.

Inspector-General Paynter reports:—

With reference to the opinions of the different Medical Officers, stated in the several Regimental Sanitary Reports, rendered from Corps serving in this Command, for the year 1868, I am disposed to consider that drinking to excess has been a very fertile cause of disease.

Inspector-General Paynter enumerates all the more important defects in construction, ventilation, drainage, and position of the different barracks, which, as they are well known, need not be here detailed at length.

Section II.

On the Extent of Invaliding among the Troops serving in the Mediterranean.

Medi-terranean.

During the year 224 invalids were sent home from the Mediterranean Commands, and 147 were finally discharged the service at Netley, being in the ratio of 22·4 and 14·7 per 1,000 of the strength, and differing very slightly from the results of the preceding year. The disabilities of the invalids are stated in Abstract No. 10 in the Appendix, from which the following Table has been framed:—

	Invalids sent home from			Invalids discharged at Netley from		
	Gibraltar.	Malta.	Total.	Gibraltar.	Malta.	Total.
Continued Fevers	1	8	9	..	..	..
Dysentery and Diarrhœa	3	1	4	1	..	1
Erysipelas	1	..	1	..	..	..
Ophthalmia	5	1	6	1	..	1
Rheumatism	11	10	21	3	2	5
Venereal Diseases	3	1	4	1	..	1
Diathetic „	..	1	1	1	..	1
Tubercular „	26	21	47	26	23	49
Diseases of the—						
Nervous System	10	13	23	5	13	18
Circulatory „	13	13	26	10	17	27
Respiratory „	5	13	18	..	2	2
Digestive „	11	15	26	6	14	20
Urinary „	1	3	4	1	1	2
Reproductive „	1	..	1	1	..	1
Locomotive „	2	3	5	1	3	4
Integumentary „	4	5	9	..	1	1
Diseases of Nutrition	11	5	16	4	8	12
Accidents and Violence	..	3	3	..	2	2
Total	108	116	224	61	86	147
Ratio per 1,000 of { 1868	23·3	21·6	22·4	13·2	16·0	14·7
Mean Strength { 1859–67	26·0	19·6	22·6	19·6	14·1	16·7

The number of invalids sent home corresponds very closely with the average of the preceding nine years, but the number finally discharged has been 2 per 1,000 under it. Tubercular diseases have been the most prominent cause of invaliding and discharge, and next to them rank diseases of the circulatory system, chiefly hypertrophy and valve disease of the heart. Under diseases of the digestive system there were 12 men discharged for hernia, which appears

Mediterranean.

a very large number; nine of these were sent home from Malta, six being gunners of the Royal Artillery with from 5 to 9 years' service.

Section III.

Mean Daily Sick.

During the year the average number constantly non-effective from sickness was 182 at Gibraltar, and 239 at Malta, exclusive of the Malta Fencibles. On these numbers the calculations in the following Table have been based:—

		Gibraltar.	Malta, exclusive of Royal Malta Fencibles.	United Kingdom. Infantry Regiments. Average of nine years, 1860–68.
Average Strength in 1868 ..		4,631	5,377	
Average constantly sick in 1868..		182	239	
Ratio per 1,000 constantly sick	1868 ..	39·30	44·45	42·18
	1859–67..	39·92	46·34	
		days	days	days
Average sick time to each Soldier	1868 ..	14·34	16·22	15·39
	1859–67..	14·57	16·91	
Average duration of the cases of disease	1868 ..	17·73	18·98	18·83
	1859–67..	18·51	19·11	

The mean daily sick and average sick time to each soldier in Gibraltar have been higher than in 1867, though still under the average of the last nine years, but the duration of the cases has undergone a slight reduction. In Malta the ratio in all these particulars has been lower than in 1867 and also under the average. The results do not differ materially from those of Infantry serving at home.

Section IV.

On the Influence of Age on the Mortality.

The following table shows the ratio of mortality at different ages in quinquennial periods of life, among the troops serving in the Mediterranean Commands. The numbers living and deaths at each age in 1868 are stated in Abstract No. 11 in the Appendix.

	Ratio of deaths per 1000 of strength at each period of life.					
	Under 20.	20 and under 25.	25 and under 30.	30 and under 35.	35 and under 40.	40 and upwards.
Mediterranean Commands.. 1868 ..	9·63	18·34	18·66	13·71	40·24	50·84
Mediterranean Commands.. 1859–67	6·10	6·82	12·38	14·48	24·40	25·97

The unusually high ratio of mortality between 20 and 30 was chiefly due to the number of violent deaths in the Royal Artillery in Malta, all of which, 10 in number, occurred between these ages, and to the fatal cases of fever in the 24th Regiment, of which 11 out of 13 were at the same periods of life.

III.—ON THE HEALTH OF THE TROOPS SERVING IN BRITISH AMERICA.

Section I.—*Sickness and Mortality.*

I.—CANADA.

STATISTICAL REPORT.

Canada.

In May the 2nd Battalion 17th Regiment left the Command for England, and the 4th Battalion 60th for New Brunswick; in June the 30th Regiment, and in November the 1st Battalion 16th proceeded to Nova Scotia; and in October the 100th Regiment embarked for England. No regiments arrived in the Command during the year.

The average strength of the troops was 9,582. The admissions into hospital were 7,000, and the deaths 99, of which 71 occurred in and 24 out of hospital, and 4 among the invalids sent home. These numbers show the admissions to have been in the proportion of 730, and the deaths of 10·33 per 1,000 of mean strength; the former corresponding exactly with, and the latter being slightly higher than, the ratio in 1867.

The following Table shows the admissions and deaths in each Corps serving in the Command:—

	Annual Average Strength.	Admitted into Hospital.	Deaths.				Annual ratio per 1,000.	
			In Hospital.	Out of Hospital.	Of Invalids.	Total.	Admitted.	Died.
13th Hussars ..	467	283	5	6	..	11	606·0	23·55
Royal Artillery ..	1,588	1,432	10	7	..	17	901·8	10·71
Royal Engineers ..	167	107	..	..	..	..	640·7	..
1st Bn. 16th Regt. ..	569	500	5	2	..	7	878·7	12·30
2nd „ 17th „ ..	235	141	..	..	..	..	600·0	..
29th Regiment ..	705	484	6	..	..	6	686·5	8·51
30th „ ..	327	189	1	..	..	1	578·0	3·06
53rd „ ..	694	687	2	..	1	3	989·9	4·32
1st Bn. 60th Regt. ..	721	563	8	1	1	10	780·9	13·87
4th „ „ „ ..	251	118	3	..	..	3	470·1	11·95
69th Regiment ..	686	509	7	1	..	8	742·0	11·66
78th „ ..	721	477	6	1	..	7	658·8	9·67
100th Regiment ..	498	472	3	2	..	5	947·8	10·04
1st Bn. Rifle Brigade	715	482	8	2	1	11	674·1	15·38
Royal Canadian Rifles	1,018	524	5	2	1	8	514·7	7·86

The other two deaths were of privates of the Commissariat Staff and Army Hospital Corps.

The admissions were considerably above the average in the 53rd and 100th Regiments, and the deaths in the 13th Hussars and 1st Battalion Rifle Brigade. In the 53rd the excess was chiefly due to venereal diseases, bronchitis, and sorethroat, and in the 100th Regiment to venereal diseases.

Canada.

The admissions and deaths by each disease are shown in Abstract No. 12 in the Appendix, of which the classified results are shown in the following Table:

Orders.	Diseases.	Strength, 9,582. Admissions.	Deaths. In Canada.	Deaths. Of Invalids.	Deaths. Total.	Annual Ratio per 1,000. 1868. Admissions.	1868. Deaths.	1859-67. Admissions.	1859-67. Died.
	Class I.								
1	Miasmatic Diseases ..	1,493	10	..	10	155·9	1·04	134·0	1·20
2	Enthetic „	1,845	..	..	..	192·6	..	165·0	·04
3	Dietic „	140	..	..	..	14·6	..	19·8	·17
4	Parasitic „	95	..	..	..	9·9	..	7·5	..
	Class II.								
1	Diathetic Diseases	29	..	..	..	3·0	..	3·1	·04
2	Tubercular „	95	17	3	20	9·9	2·10	8·6	1·63
	Class III. Diseases of the—								
1	Nervous System	167	11	..	11	17·4	1·15	16·2	1·04
2	Circulatory „	50	15	..	15	5·2	1·56	4·5	1·23
3	Respiratory „	712	19	..	19	74·3	1·98	69·8	1·40
4	Digestive „	249	2	..	2	26·0	·21	35·8	·45
5	Urinary „	23	1	1	2	2·4	·21	1·9	·15
6	Reproductive „	69	..	..	..	7·2	..	7·0	..
7	Locomotive „	28	..	..	..	2·9	..	3·1	·03
8	Integumentary „	1,049	1	..	1	109·5	·10	98·1	·04
	Class IV.								
4	Diseases of Nutrition ..	43	..	..	..	4·5	..	1·5	..
	Class V.								
1	Accidents	900	11	..	11	93·9	1·15	101·7	1·97
3	Homicide	1	1	..	1	·1	·10	..	·10
4	Suicide	5	7	..	7	·5	·73	·1	·29
5	Execution	..	..	..	..	..	..	..	·03
6	Corporal Punishment ..	..	..	..	..	..	..	1·7	..
	No appreciable disease ..	7	..	..	..	·7	..	·7	..
	Diseases not specified ..	..	..	..	..	..	..	·3	..
	Total	7,000	95	4	99	730·5	10·33	680·4	9·81

The admissions have been above the average, the excess occurring chiefly in miasmatic end enthetic diseases, and in those of the integumentary system, while there has been a decrease in dietic diseases, in those of the digestive system, and in accidents.

MIASMATIC DISEASES when subdivided give the following results:—

Diseases.	Admitted.	Died.	Ratio per 1,000 of Mean Strength. 1868. Admitted.	1868. Died.	1859-67. Admitted.	1859-67. Died.
Eruptive Fevers	63	2	6·6	·21	4·0	·09
Paroxysmal „	123	..	12·8	..	5·7	·07
Continued „	157	5	16·4	·52	17·1	·67
Dysentery, Diarrhœa, and Cholera ..	152	..	15·9	..	24·5	·11
Sorethroat and Influenza	337	1	35·2	·10	29·0	·02
Ophthalmia	160	..	16·7	..	15·1	..
Rheumatism	392	..	40·9	..	28·7	·09

Eruptive Fevers were unusually prevalent. Of the admissions 38 were caused by small-pox and 20 by scarlet fever, and one of each terminated fatally. Almost all the cases occurred among the men stationed at Montreal, where these diseases were prevailing epidemically among the civil population. All the men attacked with small-pox are stated to have had marks of vaccination, except one who had marks of previous small-pox.

Paroxysmal Fevers furnished more than double the average proportion of admissions. More than a third of the cases occurred in the Canadian Rifles; they are stated by the Surgeon of the Corps to have been "nearly all men of the Chatham Detachment."

Dysentery and Diarrhœa were much less prevalent than usual and closely approximated the amount among troops serving in the United Kingdom.

Enthetic Diseases were more prevalent than in 1867, and 28 per 1,000 above the average of the last nine years. The increase in 1868 was chiefly in cases of gonorrhœa, the proportion of venereal sores being nearly the same as in the preceding year.

Accidental and Violent Deaths.—There were only five deaths by drowning, a number considerably under the usual amount; one man was killed in a railway accident, and one was murdered by a comrade. There were seven suicidal deaths, being double the average of the last nine years, five were by fire-arms and two by poison.

The other classes of diseases differ so little from the results of 1867 as to require no special remarks.

SANITARY REPORT.

Inspector-General McIllree reports:—

The general health of the troops has been very good, and on an average not inferior to former years. Several minor sanitary improvements have been effected on the recommendation of Medical Officers of corps to their Commanding Officers. Others of a more comprehensive character have been considered inadvisable on the score of expense. They are now unnecessary on account of the reduction of the force serving in the command. On the whole, the troops have, considering the climate, been advantageously placed in a sanitary point of view.

The future health and efficiency of the troops serving in the dominion would be increased by:—

1st. The extension of the provisions of "The Contagious Diseases Prevention Act 1865" to the Command.

2nd. By disengaging soldiers as far as practicable from the every-day sameness of garrison and barrack duty, by allowing men to work at trades or other employments not strictly military, or away from towns on the public works.

3rd. The serge jacket and trowsers should be worn by all troops serving in the Dominion of Canada during the hot season.

II. Nova Scotia and New Brunswick.

STATISTICAL REPORT.

Nova Scotia and New Brunswick.

In April the 1st Battalion 15th Regiment left the Command for Bermuda, and in June the 2nd Battalion 4th Regiment for England. In May the 4th Battalion 60th, and in June the 30th Regiment arrived from Canada.

The average strength of the troops during the year was 3,519; the admissions into hospital were 1,665, and the deaths in hospital 22, out of hospital 7, and among invalids on their passage home or while awaiting their discharge in England 5, making a total of 34. The admissions therefore were in the proportion of 473, and the deaths of 9·65 per 1,000 of mean strength, the former slightly lower and the latter 2 per 1,000 higher than in 1867.

The admissions into hospital and deaths in each Corps are shown in the following Table :—

Corps.	Average Annual Strength.	Admitted into Hospital.	Died.				Ratio per 1,000 of Strength.	
			In Hospital.	Out of Hospital.	Of Invalids.	Total.	Admitted.	Died.
Royal Artillery	467	245	4	2	2	8	524·6	17·13
Royal Engineers . ..	183	66	2	..	..	2	360·7	10·93
2nd Bn. 4th Regiment ..	281	118	5	..	1	6	419·9	21·35
1st „ 15th „ ..	204	73	1	1	..	2	357·8	9·80
1st „ 16th „ ..	77	107	..	..	..	..	1389·7	..
1st „ 22nd „ ..	730	249	6	1	..	7	341·1	9·59
30th Regiment	397	204	..	2	..	2	513·8	5·04
47th „	692	315	2	..	1	3	455·2	4·33
4th Bn. 60th Regiment .	427	252	2	1	1	4	590·2	9·37

The admissions were not excessive in any of the Corps. The mortality was high in the 2nd Battalion 4th Regiment, but it was in the Command during half the year only, and in the Royal Artillery, in which two of the deaths were the result of an accident.

The admissions and deaths by the different classes of diseases are shown in the following Table, framed from Abstract No. 12 in the Appendix.

Nova Scotia and New Brunswick.

Orders.	Diseases.	1868. Mean Strength, 3,519. Admissions.	Deaths. In Nova Scotia.	Deaths. Of Invalids.	Deaths. Total.	1868. Annual Ratio per 1,000 of Strength. Admitted.	Died.	1859–67. Annual Ratio per 1,000 of Strength. Admitted.	Died.
	Class I.								
1	Miasmatic Diseases ..	322	1	..	1	91·5	·28	125·0	·74
2	Enthetic „ ..	431	..	..	..	122·5	..	179·0	..
3	Dietic „ ..	40	..	..	..	11·4	..	14·9	·41
4	Parasitic „ ..	26	..	..	..	7·4	..	9·6	..
	Class II.								
1	Diathetic Diseases ..	10	..	..	..	2·8	..	1·4	·08
2	Tubercular „ ..	27	..	3	3	7·7	·85	10·4	1·53
	Class III. Diseases of the—								
1	Nervous System ..	48	7	..	7	13·6	1·99	13·6	·79
2	Circulatory „ ..	14	1	1	2	4·0	·57	3·3	1·00
3	Respiratory „ ..	203	12	..	12	57·7	3·41	50·0	1·00
4	Digestive „ ..	60	2	..	2	17·0	·57	27·0	·41
5	Urinary „ ..	8	..	..	..	2·3	..	1·8	·04
6	Reproductive „ ..	21	..	..	..	6·0	..	4·7	..
7	Locomotive „ ..	14	..	..	..	4·0	..	2·1	·04
8	Integumentary „ ..	189	..	..	..	53·7	..	78·7	..
	Class IV.								
4	Diseases of Nutrition ..	6	..	..	..	1·7	..	·9	..
	Class V.								
1	Accidents	243	3	..	3	69·0	·85	85·4	1·20
3	Homicide	..	1	..	1	..	·28	..	·12
4	Suicide	..	2	1	3	..	·85	..	·12
6	Corporal Punishment ..	1	..	..	..	·3	..	2·4	..
	Diseases not stated ..	2	..	..	..	·5	..	·9	..
	Total	1,665	29	5	34	473·1	9·65	551·1	7·18

The admissions have been under the average of the preceding nine years; the reduction being chiefly in miasmatic diseases and those of the integumentary system and in accidents; the deaths have exceeded the average in diseases of the nervous and respiratory systems.

Miasmatic Diseases when subdivided give the following results:—

Nova Scotia and New Brunswick.

Diseases.	Admitted.	Died.	Annual Ratio per 1,000 of Mean Strength. 1868. Admitted.	1868. Died.	1859-67. Admitted.	1859-67. Died.
Eruptive Fevers	1	..	·3	..	1·0	·04
Paroxysmal „	4	..	1·1	..	1·2	..
Continued „	42	1	11·9	·28	12·4	·54
Dysentery, Diarrhœa, and Cholera ..	31	..	8·8	..	13·1	·04
Sorethroat and Influenza	78	..	22·2	..	38·3	..
Ophthalmia	67	..	19·0	..	23·3	..
Rheumatism	75	..	21·3	..	26·0	..

The results so closely approximate the average as scarcely to require notice, except as regards sorethroat and influenza, the admissions by which were greatly below the average and a little under the proportion in the preceding year.

ENTHETIC DISEASES though considerably more prevalent than in 1867 very slightly exceeded the average. The increase compared with the preceding year was not confined to any form of disease; the 1st Battalion 16th and the 4th Battalion 60th Regiments, both of which arrived from Canada during the year, furnished the highest proportion of cases.

DISEASES OF THE NERVOUS SYSTEM did not exceed the average in the admissions, but furnished more than double the usual proportion of deaths. There were three fatal cases of *delirium tremens*, two of which occurred in the Artillery; and there was one fatal case of cerebro-spinal meningitis in the 60th Regiment at Halifax.

DISEASES OF THE RESPIRATORY SYSTEM were more prevalent and fatal than usual. There seems to have been no special cause for the increase. The Medical Officer in charge of the 22nd Regiment, in which pneumonia prevailed as an epidemic in 1867, observes that "the improvements in the Exhibition "building, referred to in last report, prevented a recurrence of the pneumonic "attacks which characterized this barrack in 1866-7."

DISEASES OF THE DIGESTIVE SYSTEM were one-third less prevalent than in former years, those in which the reduction occurred being dyspepsia and colic.

ACCIDENTAL AND VIOLENT DEATHS.—Two of these were caused by the bursting of a gun when the men were firing a salute at Halifax, and one by accidental drowning on detachment at Carleton, New Brunswick. A private of the 22nd was murdered by a civilian in the suburbs of Fredericton, his skull being fractured by a blow with an iron bar. A private of the same regiment committed suicide by jumping from a canoe in the river St. John, and a private of the 30th shot himself at Halifax.

SANITARY REPORT.

Nova Scotia.

Deputy Inspector-General Chambers reports:—

The defective sanitary condition of the towns of Fredericton and St. John, New Brunswick, and St. John's, Newfoundland, as referred to in last year's General Sanitary Report, still remains unimproved to any extent; some few further minor alterations have been projected, but it is a difficult matter to arouse the local authorities to a sense of the importance that exists for some radical improvement in the drainage and general sanitary condition of these towns. This is not to be wondered at, considering that the results of the past year have been very satisfactory as far as the health of the troops is concerned, particularly in the almost entire absence of grave miasmatic disease or mor-

tality. At St. John, New Brunswick, in particular, and in a lesser degree at Fredericton, New Brunswick, and St. John's, Newfoundland, the military are, however, more liable to attacks from diseases of this nature than they would be in such a climate under more favourable circumstances. *Nova Scotia.*

The health of the troops generally would also be promoted by the application of the new system of ventilation. The cubic space per man, in both barracks and guard rooms, is still in many instances much below the regulation minimum of 600 feet.

The hospital accommodation in Halifax and New Brunswick, at present insufficient for even the ordinary sick requirements of a healthy season, will be ample for all purposes towards the end of 1869, by the completion about that time of the new garrison hospital at Halifax, and by the reduction, now contemplated, of the force in New Brunswick to the minimum number.

The guard-room and cell-space has been much improved and extended at St. John, New Brunswick, by the erection of a new building on improved principles, affording ample space and ventilation for the men on guard, and prisoners in cells; the accommodation in this respect is, however, still far too confined at Halifax for health: in some instances the men have less than 300 cubic feet each.

The bath-room accommodation at the Wellington Barracks, Halifax, requires extension, and a bath room and lavatory is very urgently required in the garrison hospital, St. John's, Newfoundland, which is at present entirely devoid of that very necessary convenience.

The cesspit system should be abolished at all stations as soon as possible; the faulty condition of the latrines and urinals (the latter being often of wood at all barracks) in the Royal Artillery and Royal Engineers' barracks, Halifax, is still a constant source of annoyance in warm weather.

The accommodation for the families of married soldiers in New Brunswick and Newfoundland, and in a lesser degree at Halifax, is very insufficient as regards the present strength of the force. A range of quarters for 20 families has been constructed at the latter station, and two ranges to accommodate 60 more are in course of completion, ample space will then be afforded for the married families of the corps stationed in the citadel and glacis barracks close to which the new quarters are situated; though small they are a great improvement on the "lodging system" hitherto in vogue, the only important drawback to the comfort of the present occupants being the insufficiency of the mid-winter allowance of fuel.

The means of lighting in both barracks and hospitals at St. John's, Newfoundland, and in New Brunswick, would be much improved, with economy to the public and advantage to the soldier, by the introduction of Albertine oil in lieu of candles. At Halifax, where this change has been carried out, good results have followed, and I therefore strongly recommend that the same be extended to the other stations as one means of weaning men from the brightly-lit drinking saloons that abound in every garrison town.

Halifax, Nova Scotia.—During the year the following improvements and alterations have been carried out:—

A covered way constructed from the temporary glacis hospital to the latrines, and water laid on to enable the latter to be flushed.

Increased accommodation for the troops and married families in the erection of a wooden barrack on the north-east slope of the citadel glacis, capable of accommodating 128 men at 600 cubic feet each, and a range of married quarters at the rear of these barracks for 20 families; two additional ranges to accommodate 30 families each are also in course of construction; all these buildings are on the latest improved sanitary principles as regards ventilation, &c.

St. John, New Brunswick.—New Barracks: cook house, Warren's apparatus substituted for old mode of cooking; ablution room, furnace and boiler to supply hot water; new guard room and cells, of improved construction and capacity.

Temporary Barracks: cooking stoves removed from the men's rooms and heating stoves substituted; cook house and ablution room erected and water laid on.

Hospital: permanent floor laid for marquee.

Nova Scotia. Canteen: a new theatre built (out of canteen funds).

Fredericton, New Brunswick.—Stone Barracks: a drill shed built behind the prison cells at this barrack; the prisoners can now perform their shot drill, &c., during wet and inclement weather.

Park Barrack: latrine changed from the "barrel" to the "cesspit" system.

Hospital: a drain constructed in the ablution room which communicates with a sewer in the yard.

Small stoves substituted for large ones in the wards: a great improvement.

III.—Newfoundland.

Newfoundland. The average strength of the troops, which consisted of a battery of the 3rd Brigade Royal Artillery and a detachment of the Royal Canadian Rifles, was 300 men, among whom there were during the year 115 admissions into hospital and 5 deaths; the latter all in the Royal Artillery. These numbers give the proportion of 383 admissions and 16·66 deaths per 1,000 of the strength, the former being considerably, and the latter slightly, under the ratio in 1867.

The diseases by which the sickness and mortality were caused are detailed in Abstract No. 12 in the Appendix; the following Table gives the results by classes:—

Orders.	Diseases.	Strength, 300.				Annual Ratio per 1,000.			
			Deaths.			1868.		1859-67.	
		Admissions.	In Newfoundland.	Of Invalids.	Total.	Admissions.	Deaths.	Admissions.	Deaths.
	Class I.								
1	Miasmatic Diseases	10	..	..	..	33·3	..	190·5	..
2	Enthetic „	15	..	..	..	50·0	..	39·9	..
3	Dietic „	17	1	..	1	56·7	3·33	35·7	·42
4	Parasitic „	1	..	..	..	3·3	..	4·2	..
	Class II.								
1	Diathetic Diseases	..	..	..	..	..	..	2·9	..
2	Tubercular „	2	1	..	1	6·7	3·33	11·3	2·52
	Class III. Diseases of the—								
1	Nervous System	10	2	..	2	33·3	6·67	32·0	1·26
2	Circulatory „	..	..	..	..	..	..	10·5	1·68
3	Respiratory „	23	..	..	..	76·7	..	77·6	2·10
4	Digestive „	5	..	..	..	16·6	..	34·4	..
5	Urinary „	..	..	..	..	..	..	2·5	·42
6	Reproductive „	..	..	..	..	..	..	3·8	..
7	Locomotive „	1	..	..	..	3·3	..	5·0	..
8	Integumentary „	15	..	..	..	50·0	..	51·6	..
	Class IV.								
4	Diseases of Nutrition	2	..	..	..	6·7	..	·8	..
	Class V.								
1	Accidents	14	1	..	1	46·7	3·33	100·7	1·26
4	Suicide	..	..	..	..	..	..	..	·42
6	Corporal Punishment	..	..	..	..	..	..	2·1	..
	Diseases not stated	..	..	..	..	..	..	2·1	..
	Total	115	5	..	5	383·3	16·66	607·6	10·08

Newfoundland.

The admissions have been greatly below the average of the preceding nine years, the reduction being chiefly in miasmatic diseases and accidents, but the mortality has been much above the average, from the effects unfortunately of intemperance; there were 25 admissions and 3 deaths the direct result of that cause. Of the other two deaths one was by pulmonary consumption and the other the result of an accident on duty, while landing ordnance stores from a ship. The very high ratio of 80 admissions and 10 deaths per 1,000 of the strength from the direct effects of drinking is a melancholy proof of the great extent to which this vice is indulged in by the troops in Newfoundland.

IV. Bermuda.

STATISTICAL REPORT.

Bermuda.

In the end of April the 1st Battalion 15th Regiment arrived from New Brunswick, and in the last week of December the 5th and part of the 34th Company Royal Engineers from Nova Scotia, as an augmentation to the force employed in the Command.

The average strength of the troops during the year was 1,649; the admissions into hospital were 1,227, and the deaths 41, of which 26 occurred in, and 10 out of hospital, and 5 among the invalids on their passage to England, and while awaiting their discharge there. The ratio of admissions was therefore 744, and of deaths 24·86 per 1,000 of the strength, the former differing little from and the latter being one-third higher than in 1867.

The admissions and deaths were distributed among the different Corps as follows:—

	Average Annual Strength.	Admitted into Hospital.	Died.				Ratio per 1,000 of Strength.	
			In Hospital.	Out of Hospital.	Of Invalids.	Total.	Admitted.	Died.
Royal Artillery...	192	105	3	1	...	4	546·9	20·83
„ Engineers	253	209	3	3	1	7	826·1	27·67
1st Bn. 15th Regiment ...	440	520	12	3	1	16	1181·8	36·36
61st Regiment	732	385	8	3	3	14	525·9	18·69

The sickness and mortality were highest in the 1st Battalion 15th Regiment, which arrived in the Command on the 28th April, but in all the Corps the ratio of deaths was very high.

The following Table, framed from Abstract No. 12 in the Appendix, shows the influence of the different classes of diseases in causing the admissions and deaths:—

Bermuda.

Orders.	Diseases.	1868. Mean Strength, 1,649. Admissions.	Deaths. In Bermuda.	Deaths. Of Invalids.	Deaths. Total.	1868. Annual Ratio per 1,000 of Strength. Admissions.	Deaths.	1859-67. Annual Ratio per 1,000 of Strength. Admissions.	Deaths.
	Class I.								
1	Miasmatic Diseases	509	18	..	18	308·7	10·92	246·0	19·92
2	Enthetic „	93	..	..	..	56·4	..	65·7	..
3	Dietic „	48	..	..	..	29·1	..	34·8	·29
4	Parasitic „	2	..	..	..	1·2	..	4·8	..
	Class II.								
1	Diathetic Diseases	7	..	..	..	4·2	..	4·5	·09
2	Tubercular „	14	..	1	1	8·5	·61	12·8	2·55
	Class III. Diseases of the—								
1	Nervous System	49	4	1	5	29·7	3·03	30·7	3·04
2	Circulatory „	10	2	2	4	6·1	2·42	6·1	·98
3	Respiratory „	60	1	..	1	36·4	·61	41·4	·59
4	Digestive „	69	1	1	2	41·8	1·21	52·4	·88
5	Urinary „	5	1	..	1	3·0	·61	1·3	..
6	Reproductive „	13	..	..	..	7·9	..	10·0	..
7	Locomotive „	5	..	..	..	3·0	..	3·4	..
8	Integumentary „	174	..	..	..	105·5	..	103·3	..
	Class IV.								
4	Diseases of Nutrition ..	14	..	..	..	8·5	..	4·2	..
	Class V.								
1	Accidents	155	7	..	7	94·0	4·24	96·0	1·87
4	Suicide	..	2	..	2	..	1·21	·1	·79
6	Corporal Punishment ..	..	..	..	..	..	..	2·6	..
	Diseases not specified ..	..	..	..	..	..	..	1·0	..
	No appreciable disease ..	..	..	..	..	..	..	·2	..
	Total..	1,227	36	5	41	744·0	24·86	721·3	31·00

The admissions were above and the deaths under the average of the preceding nine years. The excess of the former and decrease of the latter were in miasmatic diseases.

MIASMATIC DISEASES when subdivided give the following results :—

Diseases.	Admitted.	Died.	Ratio per 1,000 of Strength. 1868. Admitted.	1868. Died.	1859-67. Admitted.	1859-67. Died.
Eruptive Fevers..	1	..	·6	..	..	..
Paroxysmal „	3	..	1·8	..	2·6	·10
Continued „	182	15	110·4	9·10	65·0	1·96
Yellow Fever	..	..	..	..	49·0	17·47
Dysentery, Diarrhœa, and Cholera ..	210	3	127·4	1·82	55·1	·29
Sorethroat and Influenza..	21	..	12·7	..	17·6	·10
Ophthalmia	48	..	29·1	..	25·4	..
Rheumatism	40	..	24·3	..	25·6	..

Continued Fevers.—The ratio of admissions by this type of fever was very high, and of deaths more than five times the average of the preceding nine years. The 1st Battalion 15th Regiment had much the highest proportion both of cases and deaths, amounting to more than double that of any of the other corps. The 61st Regiment and Royal Engineers considerably exceeded the average, but the Royal Artillery enjoyed a marked immunity from that form of disease.

The 1st Battalion 15th Regiment arrived in the Command from New Brunswick in the last week of April. In the beginning of June Dysentery and diarrhœa became frequent among the men, and were soon followed by enteric fever, of which 13 cases and 1 death occurred in June, 42 and 5 in July, 15 and 1 in August, and 12 with 1 death in September, when it ceased. This outbreak of fever was attributed by the Principal Medical Officer "to the "effects of a sudden change from the cold bracing climate of New Brunswick "to the hot relaxing climate of Bermuda." Much the largest proportion of cases in June and July was furnished by four companies encamped at Port Royal, and in consequence of this they were on the 16th of July removed into the convict barracks at Boaz Island, vacated for that purpose by a company of the 61st Regiment, and were as much as possible relieved from all duties involving exposure to the heat of the sun. Cases continued to occur for ten days after the move, but by the end of the month the disease had ceased in these companies. The greater prevalence of fever in this detachment was believed by the Principal Medical Officer to be due to the greater exposure of the men to the sun on the engineer works in making a military road. In the 61st Regiment fever was most prevalent in August, September, and October, in which the admissions were 13, 15, and 17 respectively. In September, in consequence of the number of cases, the men were exempted from labour between 11 A.M. and 2 P.M.

The exemption of the Royal Artillery from fever is attributed to their having previously served at Gibraltar, and thus being more inured to the heat, and to their duties being lighter than those of the other troops.

Dysentery and Diarrhœa were greatly above the average. The former was chiefly confined to the 1st Battalion 15th Regiment, in which 64 cases occurred of a total of 81; diarrhœa was likewise very prevalent in it, but the 61st Regiment and the Royal Engineers also had a considerable number of cases. These diseases were believed to depend upon the same causes as the fevers, an opinion which seems borne out by their distribution in these Corps, and the comparative exemption enjoyed by the men of the Royal Artillery.

Ophthalmia was more prevalent than in 1867, but the excess was confined entirely to the 1st Battalion 15th Regiment, in which 40 out of a total of 48 admissions took place. This Regiment has suffered from ophthalmia to a considerable extent for a number of years, but of late there has been a gradual reduction in the amount. The admissions, however, were rather more

Bermuda. numerous than in the preceding year, a result attributed by the Surgeon of the Corps to climatic influences.

There has been a reduction in the amount of all the other classes except diseases of nutrition, which being mostly the result of fever, as might have been expected, in this year show an increase.

THE ACCIDENTAL AND VIOLENT DEATHS were unusually numerous. Two men were killed by an explosion while blasting in a quarry, four were drowned two committed suicide with fire-arms, and one died from fracture of the skull.'

SANITARY REPORT.

In reference to the sickness that prevailed among the men of the 1st Battalion 15th Regiment, the Principal Medical Officer expresses his opinion that there are no *special* means required for the future protection of the troops at present stationed in the Command, but that it is of the utmost importance that all arrivals of troops on the station should take place in the beginning of the winter season, so that they might become partially acclimatized before being exposed to the effects of the hot season. It would, he thinks, be highly advisable in a sanitary point of view, that troops should not embark for Bermuda later than the 31st October, or as near that period as possible ; and it would be a wise measure to make the reliefs from the Mediterranean stations to the West Indies.

The sanitary improvements at *St. George's,* have consisted of the construction of a complete system of drainage, with means of flushing latrines and urinals for the Royal Barracks ; the addition of a new wing to the garrison hospital, with accommodation for 30 patients, and supplied with improved water-closets, and bath and ablution rooms, (the other wing is in course of being extended and improved to the same extent) ; and the addition of married quarters for 18 families.

At *Prospect Hill,* in the extension of the Hut Barracks to a nearly complete state ; the addition of bath and ablution rooms, fitted on Jennings's improved system, both for the men's and married quarters ; the addition of increased means of cooking and washhouses to these quarters ; the addition to and improvement of the earth-closet latrines ; additional tanks for storage of water ; and the completion of a hut hospital, affording accommodation for 40 patients. When these barracks are completed they will be the best in point of accommodation, comfort, and convenience, in the Command.

The sanitary condition of the vicinity of the barracks and camps is good, with the exception of the town of St George's, which is not provided with any system of drainage.

The health of the civil population of the islands, both white and coloured, has been very good during the year. Although the sanitary condition of the troops does not appear to have been affected by any local cause, he considers it necessary to make the following recommendations for their benefit :—

1. That the officers' quarters at St. George's be increased and improved, so as to give each officer two rooms, communicating with each other by folding doors, and opening north and south on to verandahs, so as to ensure thorough ventilation.

2. That the barrack accommodation at St. George's be increased to such an extent as to provide 750 cubic feet of space per man, and to obviate the necessity of encamping a portion of the troops during the summer months.

3. That improved ablution and bath rooms, on Jennings' system, as provided at the New Hut Barracks, Prospect Hill, be provided for all the other barracks.

4. That night urinals be provided in all the barracks, so as to do away with the use of urine tubs.

5. That the small company kitchens in rear of the Royal Barracks be removed, as they obstruct the circulation of the air and are badly constructed, and spacious kitchens fitted with Deane's range be substituted ; and that all the other kitchens, which are at present only provided with the old pattern boilers and ovens, be fitted with Deane's ranges.

6. That the accommodation in the military prison be increased. Since the increase of the strength of the garrison, by the addition of a regiment, there has not been sufficient accommodation for the prisoners, and it is frequently necessary to place 4 men in a cell.

7. That the garrison stables, which are built close to the military prison wall, be removed to a short distance from all inhabited buildings. *Bermuda.*

8. Healthy exercise and amusements being an object of the greatest importance at this relaxing monotonous station, as a means of checking drunkenness and consequent crime, disease, and deaths from delirium tremens and suicide, he is of opinion that greater facilities for amusements for both officers and men are required, and that a theatre should be provided for the New Hut Barracks, Prospect, where there is a large garrison; and that billiard rooms and racket courts for the officers, and five courts and skittle alleys should be provided for the men at St. George's, Prospect, and Boaz Island.

Section II.

On the Extent of Invaliding.

British America.

During the year 235 invalids were sent to England from Canada, Nova Scotia, and Newfoundland, and 42 from Bermuda, being respectively in the ratio of 17·5 and 25·5 per 1,000 of mean strength. There were during the same period 28 invalids discharged the service in British America, and 182 at Netley, 24 of the latter from Bermuda. The ratio of discharges from the service therefore was 13·9 of invalids from Canada, &c., and 14·5 of those from Bermuda.

The disabilities of the invalids are stated in Abstract No. 13 in the Appendix, from which the following classified summary has been framed:—

	Invalids sent home		Invalids Discharged the Service		
				In England, sent from	
	From British America.	From Bermuda	In British America.	British America.	Bermuda
Chronic Dysentery	3	..	..	1	..
Ophthalmia	5	2	1	6	1
Rheumatism	15	1	..	3	1
Enthetic Diseases	14	2	4	3	1
Diathetic „	3	2	..	..	..
Tubercular „	49	12	5	42	7
Diseases of the—					
Nervous System	39	3	1	11	1
Circulatory „	28	6	2	31	3
Respiratory „	25	1	3	14	..
Digestive „	17	3	3	12	2
Urinary „	2	..	..	1	..
Reproductive „	1	..	..	1	..
Locomotive „	6	3	1	4	1
Integumentary „	9	..	1	3	..
Diseases of Nutrition	5	4	2	13	4
Accidents and Violence	14	3	5	13	3
Total	235	42	28	158	24
Ratio per 1,000 of Mean Strength { 1868	17·5	25·5	2·1	11·8	14·5
Ratio per 1,000 of Mean Strength { 1860–67	15·6	19·8	2·3	13·2	12·7

The number sent home has been slightly above the average; tubercular diseases, and those of the nervous, circulatory, and digestive systems, have been the chief causes of invaliding. The number finally discharged the

British America. service of invalids from British America was slightly under and from Bermuda slightly over the average. Tubercular diseases and those of the circulatory system were the classes which furnished the largest number of cases for discharge.

Section III.

Mean Daily Sick.

The mean daily sick of the troops in Canada amounted to 340, in Nova Scotia and New Brunswick to 79, in Newfoundland to 6·3, and in Bermuda to 55. From these numbers the calculations in the following Table have been made:—

	Canada.		Nova Scotia and New Brunswick.		Newfoundland.		Bermuda.	
	1868.	1859-67.	1868.	1859-67.	1868.	1859-67.	1868.	1859-67.
Ratio per 1,000 of strength constantly sick ..	35·50	31·74	22·45	25·22	21·00	29·37	33·35	40·33
Average sick time to each soldier	days 12·95	days 11·58	days 8·19	days 9·21	days 7·66	days 10·72	days 12·17	days 14·72
Average duration of the cases of disease	17·73	17·03	17·32	16·70	20·00	17·65	16·36	20·41

There has been an increase in Canada of the mean daily sick, the average sick time to each soldier, and the duration of the cases; there has been a considerable decrease in Bermuda in all these particulars, and a decrease in the mean daily sick and average sick time to each soldier but an increase in the duration of the cases in Nova Scotia and New Brunswick, and to a still more marked extent in Newfoundland.

Section IV.

Influence of Age on the Mortality.

The following Table, framed from Abstract No. 14 in the Appendix, shows the ratio of deaths per 1,000 living at each age, in quinquennial periods, during 1868 and on the average of the preceding nine years:—

Stations.	Ratio of Deaths per 1,000 of Strength at each age.					
	Under 20.	20 and under 25.	25 and under 30.	30 and under 35.	35 and under 40.	40 and upwards.
Canada, Nova Scotia, New Brunswick, and Newfoundland ..	7·21	4·53	11·17	14·72	12·99	31·25
Bermuda	15·04	14·76	20·89	26·60	53·57	..
Total 1868 ..	8·15	5·30	12·07	15·57	16·81	25·42
Total 1859-67 ..	3·88	6·82	11·31	11·90	20·10	17·3

IV.—ON THE HEALTH OF THE TROOPS SERVING IN THE WEST INDIES.

Section I.
Sickness and Mortality.

I. Windward and Leeward Command.

STATISTICAL REPORT.

1. White Troops.

Windward and Leeward Command.

No change took place in the composition of the force during the year. The average strength of the white troops was 806; the admissions into hospital were 892, and the deaths 8, of which 5 occurred in and 1 out of hospital, and 2 among the invalids sent to England. The admissions were therefore in the ratio of 1,107 and the deaths 9·92 per 1,000 of mean strength, the former being slightly above, and the latter under, the proportion in the preceding year.

The influence of the different classes of diseases in causing sickness and mortality is shown in the following Table. The details for 1868 will be found in Abstract No. 15 in the Appendix.

Windward and Leeward Command.

Orders.	Diseases.	1868. Strength, 806. Admitted.	Died. In the Command.	Died. Of Invalids.	Died. Total.	1868. Ratio per 1,000 Admitted.	1868. Ratio per 1,000 Died.	1859-67. Ratio per 1,000 Admitted.	1859-67. Ratio per 1,000 Died.
	Class I.								
1	Miasmatic Diseases. ..	167	1	..	1	207·2	1·24	527·1	6·42
2	Enthetic „	276	..	..	..	342·4	..	173·7	..
3	Dietic „	36	..	..	..	44·7	..	33·6	·50
4	Parasitic „	6	..	..	..	7·4	..	5·5	..
	Class II.								
1	Diathetic Diseases . ..	20	..	..	..	24·8	..	7·0	..
2	Tubercular „	11	1	1	2	13·6	2·48	10·7	1·60
	Class III. Diseases of the—								
1	Nervous System ..	46	1	..	1	57·1	1·24	33·9	1·81
2	Circulatory „	11	1	..	1	13·6	1·24	7·4	·90
3	Respiratory „	21	..	..	..	26·0	..	33·7	·30
4	Digestive „	50	1	1	2	62·1	2·48	67·7	·90
5	Urinary „	9	..	..	..	11·2	..	1·2	..
6	Reproductive „	14	..	..	..	17·4	..	17·1	..
7	Locomotive „	4	..	..	..	5·0	..	3·5	..
8	Integumentary „	117	..	..	..	145·2	..	164·6	..
	Class IV.								
4	Diseases of Nutrition ..	3	..	..	..	3·7	..	3·4	..
	Class V.								
1	Accidents	98	1	..	1	121·6	1·24	100·3	·70
4	Suicide	1	..	..	..	1·2	..	·4	·50
6	Corporal Punishment ..	..	..	..	..	..	..	2·2	..
	No appreciable disease..	2	..	..	..	2·5	..	2·2	..
	Total ..	892	6	2	8	1106·7	9·92	1195·2	13·63

The admissions and deaths were under the average of the preceding nine years. The reduction was chiefly in miasmatic diseases, but was to some extent counterbalanced as regards the admissions by a large increase in venereal diseases.

MIASMATIC DISEASES when subdivided give the following results :—

Diseases.	Admitted.	Died.	Ratio per 1,000 of Mean Strength. 1868. Admitted.	1868. Died.	1859-67. Admitted.	1859-67. Died.
Eruptive Fevers	..	..	..	..	1·1	..
Paroxysmal „	47	..	58·3	..	253·2	3·28
Continued „	15	1	18·6	1·24	48·7	·54
Yellow Fever	1	..	1·3	..	2·8	1·55
Dysentery, Diarrhœa, & Cholera	41	..	50·9	..	55·8	·27
Sorethroat and Influenza ..	30	..	37·2	..	11·8	·09
Ophthalmia	13	..	16·1	..	72·5	..
Rheumatism	17	..	21·1	..	21·6	..

Paroxysmal and Continued Fevers have both been less prevalent than in 1867, and very much below the average of the last nine years. There were no white troops in Demerara, from which formerly the greater proportion of cases

of paroxysmal fevers was furnished, but the Principal Medical Officer states that all the cases of this type in Barbadoes had originally been contracted by the men while serving in British Guiana. *Windward and Leeward Command.*

Yellow Fever.—In January three fatal cases of this disease occurred among the families of the military. The wife of a Sergeant, Royal Artillery, was attacked on the 15th and died on the 29th; the wife of a Deputy Storekeeper was attacked on the 29th, and his child on the 31st, and they died on the 2nd and 3rd of February. On the 19th of February a European non-commissioned officer of the 4th West Indian Regiment was admitted into hospital, but he recovered. There were no other cases among the troops, but a man from Her Majesty's Ship "Phœbe" was landed on the 20th October labouring under a mild form of the disease, he also recovered; he is stated to have contracted it in Grenada.

Dysentery and Diarrhœa were more prevalent than in 1867, though under the average of the last nine years. They occurred principally in the 1st Battalion 16th Regiment at Barbadoes. There was nothing special to account for the increase unless perhaps it were the exceptional drought.

Sorethroat and Influenza were also unusually prevalent; the latter disease is stated to have nearly assumed the form of an epidemic in June.

Ophthalmia furnished exactly the same number of cases as in 1867, and shows most satisfactory results compared with previous periods.

Enthetic Diseases show a considerable increase upon the results for 1867, and were double the average of the last nine years. The increase was chiefly at Barbadoes, and in primary and secondary syphilis; the amount of gonorrhœa corresponding closely with that of the preceding year.

Diathetic Diseases have been considerably above the average from the admission into hospital in the 16th Regiment of a number of cases of *anæmia*, probably the result of the deteriorating influence of tropical service during the hot months. They derived great benefit from a short residence at Gun Hill.

Diseases of the Nervous System were much above the average and considerably higher than in 1867. The most prevalent were inflammation of the ear (*otitis*), headache, and *delirium tremens*. Of the latter there were nine cases, one of which proved fatal; six of them occurred at Barbados, two at Trinidad, and the fatal one at St. Vincent's.

The other classes of diseases do not seem to require special comment.

The stations occupied by white troops were Barbadoes and Trinidad throughout the year, and St. Vincent's from the 11th of March. The admissions and deaths per 1,000 of mean annual strength, were at—

	Per 1,000 of mean strength.	
	Admissions.	Deaths.
Barbadoes	1164·2	6·62
Trinidad	1034·3	6·85
St. Vincent's	649·1	17·54

The most striking point of difference between the stations is the excess of miasmatic diseases, chiefly intermittent fever, at Trinidad, of venereal diseases at Barbadoes, and of accidents, chiefly bruises and slight wounds, at St. Vincent's. The numbers at the latter station are too small however, and the period they were under observation too short, to admit of any deductions being safely drawn as to its salubrity.

II.—Black Troops.

No change took place in the composition of the black troops employed in the Command, which consisted of the Head-Quarters of the 4th West India

Windward and Leeward Command.

Regiment and the Corps of Military Labourers. The average strength during the year amounted to 575, the admissions into hospital to 477, and the deaths to 11, giving the proportions of 829 and 19·13 per 1,000, both very much lower than in 1867, and under the average of the last nine years.

The admissions and deaths by each class of diseases are stated in Abstract No. 16 in the Appendix, and the classified results are shown in the following Table :—

Orders.	Black Troops. Diseases.	1868. Strength 575. Admitted.	1868. Strength 575. Died.	1868. Ratio per 1,000. Admitted.	1868. Ratio per 1,000. Died.	1859-67. Ratio per 1,000. Admitted.	1859-67. Ratio per 1,000. Died.
	Class I.						
1	Miasmatic Diseases	82	..	142·6	..	256·2	4·21
2	Enthetic „	196	..	340·9	..	276·0	..
3	Dietic „	2	..	3·5	..	1·1	..
4	Parasitic „	..	..	..	..	7·1	..
	Class II.						
1	Diathetic Diseases	1	..	1·7	..	5·3	·51
2	Tubercular „	13	5	22·6	8·69	20·1	6·90
	Class III. Diseases of the—						
1	Nervous System	15	2	26·1	3·48	18·8	1·91
2	Circulatory „	2	..	3·5	..	2·8	1·28
3	Respiratory „	26	1	45·2	1·74	74·1	2·56
4	Digestive „	13	1	22·6	1·74	33·2	1·28
5	Urinary „	3	..	5·2	..	2·9	·64
6	Reproductive „	5	..	8·7	..	13·5	..
7	Locomotive „	1	..	1·7	..	2·7	..
8	Integumentary „	47	..	81·7	..	128·7	·12
	Class IV.						
4	Diseases of Nutrition	..	..	..	..	1·3	·25
	Class V.						
1	Accidents	71	1	123·5	1·74	68·5	·50
3	Homicide	..	..	..	..	·2	·37
4	Suicide	..	1	..	1·74	·1	·64
5	Execution	..	..	..	..	..	·12
6	Corporal Punishment	..	..	..	..	4·7	..
	Diseases not specified	..	..	..	..	8·6	..
	Total	477	11	829·5	19·13	925·9	21·29

The reduction upon the results for 1867 was chiefly in miasmatic and enthetic diseases, but it extended also to most of the other classes except diseases of the integumentary system and accidents. Compared with the results of the preceding nine years there was a marked reduction in miasmatic diseases, and in those of the respiratory, digestive, and integumentary systems, but an increase in enthetic diseases and in accidents.

MIASMATIC DISEASES when subdivided give the following results :—

Windward and Leeward Command.

Diseases.	Admitted.	Died.	Annual Ratio per 1,000 of Mean Strength.			
			1868.		1859-67.	
			Admitted.	Died.	Admitted.	Died.
Eruptive Fevers	..	..	..	..	17·3	·25
Paroxysmal ,, ...	31	..	53·9	..	72·0	1·52
Continued ,, ...	1	..	1·7	..	16·8	·76
Dysentery and Diarrhœa	10	..	17·4	..	19·9	1·02
Sorethroat and Influenza	6	..	10·4	..	19·9	..
Ophthalmia..	9	..	15·6	..	21·9	..
Rheumatism	25	..	43·5	..	80·3	·51

There were no admissions by *eruptive fevers*. The ratio of *paroxysmal fevers* though considerably below the average of the last nine years was slightly above that of 1867, but this was more than counterbalanced by the decrease in *continued fevers*, which caused only one admission during the year. There was an increase compared with 1867 in the amount of *sorethroat and influenza*, and *ophthalmia*, but they were still under the average, and the number of cases was so small that considerable fluctuations in the ratio might be anticipated.

ENTHETIC DISEASES.—The ratio of admissions by this class though still above the average, was 150 per 1,000 lower than in the preceding year. The reduction has not been confined to the gonorrhœal group, but has been much more marked in it than in the syphilitic; though there has been a considerable decrease in the latter the number of cases of secondary syphilis has been more than double that of the preceding year.

ACCIDENTS AND VIOLENCE.—The admissions by this class were much above the average. The excess was chiefly from a number of cases of blistered feet; these are stated by the Medical Officer in charge to have occurred entirely among the recruits of the 4th West India Regiment, "who never wore a shoe "previous to entering the Army."

The two principal stations occupied by the black troops were Barbadoes and Demerara, the strength being 429 and 128. The ratio of admissions and deaths at each was as follows:—

	Per 1,000.	
	Admissions.	Deaths.
Barbadoes	839·1	16·31
Demerara	859·3	31·24

The most striking difference between the two stations was the excess of miasmatic diseases at Demerara and of enthetic diseases at Barbadoes; diseases of the respiratory system were also much above the average at Demerara, from the occurrence of a number of cases of bronchitis, but no details regarding them have been given in the Regimental Report. Although yellow fever prevailed to a considerable extent among the shipping in the early part of the year, no cases occurred among the troops.

SANITARY REPORT.

Deputy Inspector-General Frazer reports:—

"The health of the white troops at Barbados has been remarkably good during the year. There has been no special cause of sickness, and the statements made in the Sanitary Reports by Medical Officers, are in accordance

Barbadoes. with my own observation and experience. In my Annual Sanitary Inspection Reports of the several stations, I have submitted suggestions in detail, calculated, in my opinion, to improve the health and comfort of the troops in future, and here I may briefly summarise them.

At Barbadoes there has been no increased cubic accommodation in barracks during the year, but the average occupation of the Royal Artillery Barracks has admitted of each inmate having 1,000 cubic feet and 80 superficial feet of space. Their ventilation is good and effective. The hired married huts should be rebuilt, to make them fit for occupation.

The ablution rooms, with basins and foot baths and night urinals, having water laid on in sufficient quantity, excepting to the baths, are in excellent condition, with light and ventilation separate from the barrack rooms. There are also water latrines (Jennings's) and urinals outside.

There is an excellent Deane's cooking range, and also boilers, affording ample variety in preparing the artilleryman's rations, which are of average good quality.

There has been no alteration in the clothing, which is on the whole suitable to the climate.

The pipe drainage into the sea is good and effective, and the surface drainage is also good.

The swampy littoral ground below St. Anne's Fort, and in the vicinity of the iron and stone barrack, has not been drained. The Savannah, common to the white and black troops at St. Anne's, is sufficiently drained.

The brick barracks, occupied during the year by the 2nd Battalion 16th Regiment, have been somewhat crowded; they are calculated to accommodate only 300 men, at 1,000 cubic feet and 80 square feet per bed, which in my opinion should not be exceeded. The average occupation has been 360, varying according to the strength from 286 to 428. They are inadequately ventilated to insure sufficient movement of air at night; the upper story should be provided with ridge ventilation, the lower story should have all the shutters jalousied, and large air inlets and outlets made in the walls, below the eaves, opening into verandahs, similar to those in the Artillery barracks.

The new married quarters are very good, but too limited in number, only 24; while many familes on the strength live outside in unsuitable huts, sleeping on floors without bedsteads, thereby contracting sickness.

The Staff-Serjeants' quarters require reconstruction, and are seldom without cases of sickness amongst the women and children; several improvements have been suggested, and refused because of the expense.

The ablution rooms are good, with sufficient water laid on; but there are no baths for men or officers; they are very much wanted.

There has been no change in the soldiers' diet, the cooking of which is varied every alternate day in two excellent cooking ranges (Deane's) and boilers provided in two cook houses.

The clothing of the men has been on the whole suitable, viz.:—cloth or serge trowsers, and white patrol jackets.

There is an excellent water latrine (Jennings's) and water urinals, with an abundant supply of water laid on to them from the Bridgetown Water Works, which is sufficient for all sanitary purposes.

A corresponding latrine and urinal are wanted for the southern block.

Night urinals should also be introduced into these barracks, and urine tubs in the tropics abolished, as has been done in the Royal Artillery barracks.

The pipe drainage into the sea is excellent and satisfactory; the surface drainage is pretty good.

The surface drainage of the Savannah is sufficient, by French drains into the old culvert which leads into the sea.

The surface drainage of the field between the barrack and hospital, during the rainy months, would be improved by soak wells, one of which has been made near the hospital, with some measure of improvement.

There is no drainage in the vicinity amongst native huts; outside the gates and walls open privies are used.

The Iron and Stone barracks, occupied by black troops, are generally in a satisfactory condition as to ventilation and cubic space accommodation, the latter being at the reduced rate of 600 feet allowed for native troops.

Barbadoes.

The means of cooking, ablution, and the rations, are good, and the same as for white troops.

The quarters of the white non-commissioned officers should be rebuilt, being in the present state unfit for occupation.

There are good urinals with water laid on; but the cesspit privy is an offensive nuisance, and can only be remedied by its conversion into a water latrine, connected with the main Artillery sewage pipe, which passes within a short distance. This privy, with some adjoining ones in the Military Store Department, were believed to be connected with the origin of 2 fatal cases of yellow fever on the 2nd and 3rd February last, in the wife and child of the Deputy Superintendent of Stores, necessitating his change of quarters.

The undrained littoral swamp in the vicinity has been already alluded to.

There has been ample accommodation in the hospital, the cubic space exceeding the regulated 1,500 cubic feet and 100 square feet per bed.

The ventilation of the upper story is good, that of the lower would be improved by inlets or shafts in the walls. It is occupied by black troops.

It is unnecessary to refer to the defective ablution, latrine, and urinal arrangements, as a main large (12-inch) drainage pipe has been laid into the sea; and new water-closets, ablution rooms, baths, urinals, and sinks, with an abundant supply of water, duly laid on, are now in course of construction.

The above conveniences are in small buildings at the gables, with separate ventilation and light.

A water latrine ontside for convalescents is also contemplated, and when they are all completed, the hospital may be considered to be in all respects in a very satisfactory condition; excepting in the essential matter of its low and shut-in locality or site, common to it and the other barracks.

The elevated position of Gun Hill was used as a sanitarium for a few months, for cases of tedious convalescence of officers and men requiring change, with very salutary results.

The following is a statement from the Royal Engineer Department of the Sanitary Improvements during 1868:—

Erecting a urinal, and providing means for washing in the prisoners' room at the Brick Barracks Garrison Hospital.

Laying down earthenware drainage pipes to all the buildings, and 12-inch cast-iron pipes to carry off all soil, &c., into the sea below low water mark.

Erecting lavatories, baths, water-closets, and urinals in a building northward of the large (or A) pavilion. There are 4 water-closets, 2 urinals, 2 baths, 2 slop sinks, and 2 ablution tables for two persons, each fitted up in this building."

II. Jamaica.

STATISTICAL REPORT.

I. White Troops.

Jamaica.

The white troops consisted as in 1867 of a Battery of Royal Artillery, the 84th Regiment, a few men of the Army Hospital Corps, and the European non-commissioned officers of the 3rd West India Regiment. Their average strength was 778; the admissions into hospital among them were 451, and the deaths 6, including 1 which occurred out of hospital and 3 among the invalids sent to England. These numbers give the ratio of 580 admissions and 7·70 deaths per 1,000 of mean strength, the former being lower than in any of the preceding nine years, and the latter lower than in all except that in 1864.

The following Table shows the influence of the different classes of diseases upon the sickness and mortality. The details for 1868 will be found in Abstract No. 15 in the Appendix.

Jamaica.

Order.	Diseases.	1868. Strength, 778. Admissions.	Deaths. In Jamaica.	Deaths. Of Invalids.	Deaths. Total.	Ratio per 1,000. Admitted.	Ratio per 1,000. Died.	1859-67. Ratio per 1,000. Admitted.	1859-67. Ratio per 1,000. Died.
	Class I.								
1	Miasmatic Diseases ..	86	1	..	1	110·5	1·28	431·1	13·23
2	Enthetic „ ..	84	..	..	..	108·0	..	121·2	..
3	Dietic „ ..	24	..	..	..	30·9	..	32·8	·49
4	Parasitic „ ..	4	..	..	..	5·1	..	10·9	..
	Class II.								
1	Diathetic Diseases ..	4	..	..	..	5·1	..	2·9	·16
2	Tubercular „ ..	9	1	1	2	11·6	2·57	9·6	1·64
	Class III.								
	Diseases of the—								
1	Nervous System ..	21	..	..	..	27·0	..	22·2	1·64
2	Circulatory „ ..	10	..	2	2	12·9	2·57	5·9	1·80
3	Respiratory „ ..	19	..	..	..	24·4	..	44·6	·65
4	Digestive „ ..	24	1	..	1	30·9	1·28	69.8	1·14
5	Urinary „ ..	..	..	..	..	..	..	2·6	·16
6	Reproductive „ ..	4	..	..	..	5·1	..	6·4	..
7	Locomotive „ ..	11	..	..	..	14·1	..	4·2	·16
8	Integumentary „ ..	61	..	..	..	78·4	..	148·7	..
	Class IV.								
4	Diseases of Nutrition ..	10	..	..	..	12·9	..	26·0	·16
	Class V.								
1	Accidents	80	..	..	..	102·8	..	136·1	·49
3	Homicide	..	..	..	..	..	..	..	·16
4	Suicide	..	..	..	..	..	..	·1	·82
6	Corporal Punishment ..	..	..	..	..	..	..	3·8	..
	Diseases not specified ..	..	..	..	..	..	..	·6	..
	Total	451	3	3	6	579·7	7·70	1079·5	22·70

The admissions have been in the proportion of little more than half and the deaths of one-third of the average of the preceding nine years. The difference has been chiefly in the class of miasmatic diseases, but it has also been marked in the admissions by diseases of the digestive and integumentary systems and in accidents.

MIASMATIC DISEASES.—The admissions and deaths by the principal diseases in this class have been as follows:—

Diseases.	Admitted	Died.	Ratio per 1,000 of Mean Strength. 1868. Admitted	1868. Died.	1859-67. Admitted	1859-67. Died.
Eruptive Fevers	..	..	..	...	·6	..
Paroxysmal „	35	1	45·0	1·28	141·3	3·10
Continued „	12	..	15·4	..	106·8	3·10
Yellow Fever	..	..	..	..	15·0	6·37
Dysentery, Diarrhœa, &c. ..	14	..	18·0	..	50·8	·32
Sorethroat and Influenza ..	5	..	6·4	..	19·8	..
Ophthalmia	6	..	7·7	..	58·5	..
Rheumatism	11	..	14·1	..	32·7	·16

Every one of these diseases has been much below the average of the preceding nine years, and, with the exception of sorethroat and influenza, in a very marked degree under the proportion in 1867. There was no case of yellow fever during the year, and the only fatal case of miasmatic disease was one of remittent fever at Newcastle. The state of the troops as regards this class was extremely satisfactory.

ENTHETIC DISEASES were higher than in 1867, but under the average of preceding years, and contrast very favourably with the amount in the Windward and Leeward Command. Two-thirds of the cases were of the gonorrhœal and only one-third of the syphilitic group.

DISEASES OF THE INTEGUMENTARY SYSTEM show a very great reduction; this has taken place chiefly in boils (*phlegmon*) and abscesses. There has also been a marked decrease in the admissions from accidents.

II. BLACK TROOPS.

The black troops consisted as in 1867 of the Additional Gunners R.A., and the 3rd West India Regiment. The average strength was 878, the admissions into hospital were 944, and the deaths were 17. These numbers give the ratio of 1,075 admissions, and 19·37 deaths per 1,000 of mean strength, being considerably lower than in the preceding year.

The following Table shows the sickness and mortality by classes of diseases. The details for 1868 are given in Abstract No. 16 in the Appendix :—

Jamaica.

Order.	Black Troops. Diseases.	1868. Strength, 878. Admitted.	Died at Jamaica.	Ratio per 1,000. Admitted.	Died.	1859-67. Ratio per 1,000. Admitted.	Died.
	Class I.						
1	Miasmatic Diseases.. ..	220	3	250·6	3·42	474·4	7·43
2	Enthetic „	330	1	375·9	1·14	398·4	·46
3	Dietic „	2	..	2·3	..	2·5	..
4	Parasitic „	5	..	5·7	..	9·3	..
	Class II.						
1	Diathetic Diseases	3	..	3·4	..	6·2	·62
2	Tubercular „	37	9	42·1	10·25	19·0	6·35
	Class III. Diseases of the—						
1	Nervous System ..	29	1	33·0	1·14	23·0	1·86
2	Circulatory „	1	..	1·1	..	2·5	·77
3	Respiratory „	63	1	71·8	1·14	79·0	4·50
4	Digestive „	36	1	41·0	1·14	37·0	2·17
5	Urinary „	5	..	5·7	..	4·6	·15
6	Reproductive „	13	..	14·8	..	14·4	..
7	Locomotive „	8	..	9·1	..	5·6	..
8	Integumentary „	111	1	126·4	1·14	134·2	·15
	Class IV.						
4	Diseases of Nutrition ..	8	..	9·1	..	2·5	·15
	Class V.						
1	Accidents	73	..	83·2	..	72·3	·77
3	Homicide	..	..	..	..	·3	·30
4	Suicide	..	..	..	..	..	·93
5	Execution	..	..	..	..	..	·31
6	Corporal Punishment ..	..	..	..	..	3·2	..
	Diseases not specified ..	..	..	..	..	1·7	..
	Total	944	17	1075·2	19·37	1290·1	26·92

The admissions and deaths have been much below the average of the preceding nine years, the difference being chiefly in miasmatic diseases, and also as regards the deaths, in those of the respiratory system.

MIASMATIC DISEASES.—The following Table shows the admissions and deaths by the principal diseases in this class :—

Diseases.	Admitted.	Died.	Annual Ratio per 1,000 of Mean Strength. 1868. Admitted.	Died.	1859-67. Admitted.	Died.
Eruptive Fevers	2	..	2·3	..	7·3	·62
Paroxysmal „	5	..	5·7	..	248·4	3·40
Continued „	91	3	103·6	3·42	46·4	2·01
Dysentery and Diarrhœa ..	9	..	10·3	..	32·3	1·08
Sorethroat and Influenza ..	7	..	8·0	..	29·7	..
Ophthalmia	24	..	27·3	..	23·1	..
Rheumatism	70	..	79·7	..	83·3	·16

The admissions by all these diseases have been lower than in 1867. Compared with the results for the last nine years there has been a very great decrease in *paroxysmal fevers*, but this has been to some extent counterbalanced by an increase in those of the *continued* type. Upon the whole however there has been a reduction in these two forms to the extent of 185 per 1,000 in the admissions, and 2 per 1,000 in the deaths. There has also been a reduction of two-thirds in the prevalence of *dysentery and diarrhœa*, which so often arise from the same causes as the paroxysmal fevers. *Ophthalmia* was slightly above the average but shows a decrease upon the amount in 1867. *Jamaica*

Enthetic Diseases were below the average and considerably lower than in the preceding year; the decrease was entirely in gonorrhœa, the proportion of primary venereal sores having been almost identical in the two years. The amount of these diseases contrasts very unfavourably with that among the white troops in the same Command.

Tubercular Diseases were more prevalent and fatal than in 1867 and considerably above the average. The increase was partly in cases of consumption and partly in scrofula. The very high ratio of consumption is attributed by the Medical Officer in charge to the extreme immorality and unlimited sexual indulgence of the negro from the earliest age possible, with the resulting prevalence of venereal diseases.

The other classes of diseases do not seem to require special comment.

SANITARY REPORT.

Deputy Inspector-General O'Flaherty reports:—

During the year 1868 the stations occupied by troops were:—Newcastle, 84th Regiment and Detachment Royal Artillery; Up Park Camp, 3rd West India Regiment; Port Royal and Kingston, Detachment Royal Artillery and 3rd West India Regiment; Spanish Town, Falmouth, and Port Antonio, were occupied by Detachments, 3rd West India Regiment; Mandeville, by a Detachment, 84th Regiment. The four first of these stations are permanently occupied, the four latter but temporarily so.

Falmouth and Port Antonio are very old Barracks, and only reoccupied, after a very long vacancy, since December 1865.

Spanish Town Barrack, now in occupation by soldiers, consists of one room, and the necessary out-offices sufficient to accommodate 25 men. It is a detached portion of a building formerly used as public offices, and is well suited for its present use, viz., the accommodation of a guard upon the residence of his Excellency the Governor of the island.

Mandeville Barrack is a hired building, occupied by 45 men of 84th Regiment, the remainder of the Detachment, about 55 men, being placed in tents on the ground within the enclosure; the cost of rent, repairs, &c., for this station, as well as for repairs, &c., at Spanish Town, Falmouth, and Port Antonio, is defrayed by the colony.

The troops throughout the island, during 1868, have had excellent health, and no Medical Officer at any of the stations has reported that any soldier has had his health affected by any of the defective or insanitary conditions detailed in the several sanitary reports as still existing.

As a means of improving the soldier's health in future, I would suggest that more hut accommodations be provided for officers, men, and married soldiers at Newcastle; and that the general recommendations of the Committee that investigated and reported upon the epidemic of yellow fever that affected this island, including Newcastle, in 1867, be carried out as soon as practicable at Newcastle; that Court-Martial prisoners be imprisoned at Newcastle instead of in Kingston Penitentiary, and that hard labour sentences be made available in the execution of the works and improvements necessary at that station; that a light woollen tunic be substituted for the white linen one now in use; and that the black soldiers of 3rd West India Regiment be provided with a supper meal daily as white troops are.

The sanitary works during the year have been, at Newcastle, a recreation room completed and occupied; a hut for 50 men of Royal Artillery upon the ridge farm site has been commenced, and portions of stone of the sustaining walls of the huts have been removed, so as to admit free access beneath the

Jamaica. hut floors for air, and for cleansing the ground when necessary; drains have been repaired and extended, and some new ones constructed.

The bush in vicinity of barracks has been cut down to a much greater distance than last year, and its rapid growth prevented by more frequent cutting: drains still require to lengthened.

At Up Park Camp a new system for flushing and draining existing latrines into a large covered brick reservoir, to be constructed at some distance from the Barracks, has been commenced.

Port Royal has had its canteen accommodation very much enlarged, and the officers' quarters have been ventilated throughout.

At Mandeville an ablution shed has been erected, and the tent covered in; but improved conservancy as to latrine (refused) is urgently required there. If this and the other temporary stations are to be permanently occupied, many requirements are necessary, to complete which a very large expenditure will have to be provided for by the colony.

III. Bahamas.

STATISTICAL REPORT.

Bahamas. The average strength of the white troops during the year was 12 non-commissioned officers, among whom there were 8 admissions into hospital and no deaths.

The average strength of the black troops—2nd West India Regiment, was 337; the admissions into hospital were 439, and the deaths 5, of which 1 occurred out of hospital; the ratio of the former therefore was 1303, and of the latter 14·84 per 1,000 of mean strength. The sickness has been higher but the mortality one-third less than in the preceding year.

The influence of the different classes in causing the admissions and deaths is shown in the following Table, framed from Abstract No. 16 in the Appendix:—

Order.	Black Troops. Diseases.	1868. Strength, 337. Admitted.	Died.	Annual Ratio per 1,000. Admitted.	Died.	1859-67. Annual Ratio per 1,000. Admitted.	Died.
	Class I.						
1	Miasmatic Diseases ..	122	..	362·0	..	305·3	3·95
2	Enthetic „ ..	202	..	599·4	..	199·0	·60
3	Dietic „ ..	1	..	3·0	..	2·4	..
4	Parasitic „ ..	..	..	..	..	5·2	..
	Class II.						
1	Diathetic Diseases ..	1	..	3·0	..	13·4	·61
2	Tubercular „ ..	7	4	20·8	11·87	28·0	10·95
	Class III. Diseases of the—						
1	Nervous System ..	3	1	8·9	2·97	17·6	1·82
2	Circulatory „ ..	..	..	..	..	2·4	·60
3	Respiratory „ ..	16	..	47·5	..	87·5	5·48
4	Digestive „ ..	3	..	8·9	..	23·1	1·52
5	Urinary „ ..	..	..	..	..	3·0	·60
6	Reproductive „ ..	4	..	11·9	..	16·1	..
7	Locomotive „ ..	5	..	14·8	..	4·2	..
8	Integumentary „ ..	42	..	124·6	..	97·5	·60
	Class IV.						
4	Diseases of Nutrition ..	..	..	..	..	·9	..
	Class V.						
1	Accidents	33	..	97·9	..	72·6	·30
4	Suicide	..	..	..	..	·3	·30
6	Corporal Punishment ..	..	..	..	..	3·6	..
	Diseases not specified ..	..	..	..	..	2·4	..
	Total	439	5	1302·7	14·84	884·5	27·33

Compared with the results for 1867 there has been an increase in miasmatic and enthetic diseases and a decrease in all the other classes except those of the locomotive system and accidents. The excess has been chiefly in cases of continued fever, diarrhœa, and ophthalmia. There has been a decrease in the amount of rheumatism. The cases of continued fever appear to have been of malarial origin, and might without impropriety have been returned as remittent. Fever was very generally prevalent among the black civil population.

ENTHETIC DISEASES were enormously in excess of the average, and were considerably above the very high ratio of 1867. From an examination of subsequent quarterly returns they appear now to be on the decrease.

TUBERCULAR DISEASES.—The deaths by this class were slightly above the average: three of them were from consumption and one from psoas abscess. The slight excess above the average was much more than counterbalanced by the exemption from deaths by diseases of the respiratory system, of which the average in preceding years was high.

SANITARY REPORT.

The Senior Medical Officer reports:—

The number of cases has been at a higher rate than in the previous year, but the mortality lower; venereal affections and fevers being the principal diseases. Officers and white serjeants have enjoyed better health than the black men. The station and climate may be considered to have been healthy. The situation and construction of the Barracks and hospital good. The base-

Bahamas. ment arches of the former should, however, be freed from the obstructions. The conservancy has been improved. The water supply is bad, and tanks for rain-water form the only plan by which pure water can be ensured. The diet has been improved during the year, but it, as well as the clothing, is scarcely adapted to the climate.

IV. HONDURAS.

STATISTICAL REPORT.

Honduras. There were only two European non-commissioned officers at this station, neither of whom died.

The average strength of the black troops, which consisted of a few gunners additional Royal Artillery, and a detachment of the 4th West India Regiment, was 270; the admissions into hospital were 164 and the deaths 4, being in the ratio of 607 and 14·81 per 1,000 of strength, and both very much lower than in the preceding year.

The following Table, framed from Abstract No. 16 in the Appendix, shows the admissions and deaths by the different classes of diseases :—

Order.	Black Troops.	1868. Strength, 270.		1868. Annual Ratio per 1,000.		1859-67. Annual Ratio per 1,000.	
	Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
	Class I.						
1	Miasmatic Diseases ..	67	2	248·2	7·41	418·0	2·47
2	Enthetic „ ..	33	..	122·2	..	126·2	..
3	Dietic „ ..	1	..	3·7	..	2·1	1·05
4	Parasitic „ ..	..	..	..	..	12·6	..
	Class II.						
1	Diathetic Diseases ..	1	..	3·7	..	4·6	..
2	Tubercular „ ..	3	..	11·1	..	6·7	3·90
	Class III. Diseases of the—						
1	Nervous System ..	5	..	18·5	..	15·5	2·82
2	Circulatory „ ..	..	..	..	..	3·2	2·12
3	Respiratory „ ..	16	..	59·2	..	52·5	2·12
4	Digestive „ ..	3	..	11·1	..	35·6	·70
5	Urinary „ ..	..	..	..	..	2·1	..
6	Reproductive „ ..	4	..	14·8	..	14·1	..
7	Locomotive „ ..	1	..	3·7	..	3·2	..
8	Integumentary „ ..	19	..	70·4	..	146·0	·35
	Class IV.						
4	Diseases of Nutrition..	..	..	..	..	3·2	..
	Class V.						
1	Accidents	11	1	40·8	3·70	84·6	1·76
2	Battle	..	..	..	..	4·6	2·12
3	Homicide	..	..	..	..	..	·35
4	Suicide	..	1	..	3·70	·7	·70
5	Execution	..	..	..	..	..	·35
6	Corporal Punishment..	..	..	..	..	4·2	..
	Diseases not specified..	..	..	..	..	1·0	·35
	Total ..	164	4	607·4	14·81	940·7	21·16

The admissions and deaths were rather more than a third under the average. The reduction was chiefly in miasmatic diseases and those of the integumentary system.

ENTHETIC DISEASES were much less prevalent than in 1867, but did not differ greatly from the average of the last nine years. *Honduras.*

Towards the end of December 1867 epidemic cholera broke out among the native population in the neighbourhood of Belize, and it was deemed prudent, as a precautionary measure, to remove as many of the troops as could be spared to Corozal, where they were encamped about a mile from the town and close to the sea. The disease prevailed to a considerable extent at Belize, till the beginning of February. One of the men left at Belize died of it on the 14th of January, and one of those sent to Corozal on the 10th of the same month, but it did not spread among the military. In the end of March the troops were withdrawn from Corozal, and during the rest of the year were quartered at Belize, with a detachment at Young Girl till the beginning of October. The detachments at Orange Walk and Indian Church were called in to Corozal when cholera appeared among the civil population at these stations.

The only deaths besides the two from cholera were, one by accidental drowning and one suicidal by fire-arms.

Section II.

On the Extent of Invaliding.

West Indies.

The total number of invalids sent to England from the West Indies during the year was 68, of whom 32 were from the Windward and Leeward Command, and 36 from Jamaica, being in the ratio of 39·70 and 46·27 per 1,000 of the mean strength in each Command.

There were 19 invalids from the Windward and Leeward Command, and 18 from Jamaica, discharged at Netley during the year, and 44 invalids of the black troops serving in the West Indies and Western Africa discharged in the Colonies. These numbers give the proportions of 23·57 and 23·14 of the white troops, and 14·74 of the black troops per 1,000 of strength discharged the Service.

The following Table, framed from Abstracts Nos. 15 and 16 in the Appendix, shows the classes of disabilities for which the men were invalided and discharged:—

West Indies.

	White Troops.				Black Troops.
	Windward and Leeward Command.	Jamaica.	Windward and Leeward Command.	Jamaica.	West Indies and Western Africa.
Mean Strength	806.	778.	806.	778.	2,984.
Classes of Disabilities ..	Invalids sent Home.	Invalids sent Home.	Discharged as Invalids at Netley.	Discharged as Invalids at Netley.	Discharged as Invalids in the Colonies
Paroxysmal Fevers	..	..	1	..	..
Dysentery and Diarrhœa ..	..	1	..	..	2
Ophthalmia	..	..	..	..	1
Rheumatism	..	1	1	..	6
Venereal Diseases	2	..	1	..	4
Diathetic „	1	..	1	1	..
Tubercular „	6	6	3	1	10
Diseases of the—					
Nervous System	8	4	..	2	5
Circulatory „	7	8	7	4	1
Respiratory „	..	1	..	..	2
Digestive „	2	1	1	1	2
Urinary „	3	..	1	1	..
Reproductive „	..	..	..	1	1
Locomotive „	1	1	..	..	3
Integumentary „	..	3	..	1	..
Diseases of Nutrition	..	8	..	5	6
Accidents and Violence ..	2	2	3	1	1
Total	32	36	19	18	44
Ratio per 1,000 of Mean Strength .. 1868 ..	39·70	46·27	23·57	23·14	14·74
Ratio per 1,000 of Mean Strength .. 1860–67	28·65	26·37	21·00	19·64	17·63

These ratios show a considerable excess in the numbers sent home as invalids from both the West India Commands; the most prominent disabilities being tubercular diseases and those of the nervous and circulatory systems. The number discharged the service at Netley, however, very slightly exceeded the average, and it is worthy of remark, that diseases of the nervous system formed a very small item in the causes of discharge. Among the black troops tubercular diseases were the most frequent cause of invaliding; four out of the six discharges for diseases of nutrition were returned under the head of old age.

Section III.

Mean Daily Sick.

The average number constantly non-effective from sickness among the white troops was 37 in the Windward and Leeward Command, and 25 in Jamaica; and among the black troops, 28 in the Windward and Leeward Command, 67 in Jamaica, 22 in the Bahamas, and 5·2 in Honduras.

		White Troops.		Black Troops.		
		Windward and Leeward Command.	Jamaica.	Windward and Leeward Command.	Jamaica.	Bahamas.
Ratio per 1,000 constantly Sick.	1868 ..	45·91	32·13	74·67	76·83	65·28
	1859–67 ..	48·57	44·43	47·18	63·13	49·33
		days.	days.	days.	days.	days.
Mean sick time to each Soldier.	1868 ..	16·76	11·73	27·25	28·04	23·83
	1859–67 ..	17·67	16·22	17·22	23·04	18·00
Average duration of the Cases.	1868 ..	15·14	20·23	21·42	25·91	18·29
	1859–67 ..	14·81	15·02	18·60	17·86	20·22

Compared with the results for 1867 there has been a decrease in the ratio constantly sick and the mean sick time to each soldier, except in the Bahamas, which show an increase in these particulars. There has been an increase in the duration of the cases in Jamaica and the Bahamas, but a decrease in the other Commands.

Compared, however, with the average of the last nine years there has been a great increase in the proportion constantly sick of the black troops, in the mean sick time to each soldier of that force, and in the duration of the cases, except in the Bahamas. Among the white troops the mean daily sick, and sick time to each soldier have been under the average, but the duration of cases above it.

The Returns from Honduras were so obviously incorrect that we have been compelled to omit it from the Table.

Section IV.

Influence of Age on the Mortality.

The influence of age on the mortality in the West Indies and Western Africa is shown in the following Table. The details for 1868 will be found in Abstract No. 18 in the Appendix.

Station.		Ratio of Deaths per 1,000 of Strength at each period of Life.					
		Under 20 Years.	20 and under 25.	25 and under 30.	30 and under 35.	35 and under 40.	40 and Upwards.
White Troops. West Indies.	1868	..	2·82	12·66	4·13	37·04	..
	1861–67	..	5·15	12·80	16·36	27·12	62·50
Black Troops. West Indies & Western Africa	1868	21·74	8·41	33·21	25·51	41·24	..
	1861–67	11·36	26·25	25·55	24·31	21·19	36·36

This Table shows a very marked increase in the mortality of the white troops above 35 years of age, but the same increase is not observed on the average of the preceding period among the black troops. The most remarkable feature with respect to them is the uniformity of the death rate in the three quinquennial periods between 20 and 35 years of age on the average of a series of years.

V.—ON THE HEALTH OF THE TROOPS SERVING IN WESTERN AFRICA.

Section I.

Sickness and Mortality.

STATISTICAL REPORT.

Western Africa.

THE white troops on the West Coast of Africa consisted of non-commissioned officers of the 1st and 2nd West India Regiments. Their number was on the average 15; there were 26 cases of disease among them and 1 death—that of a serjeant of the 2nd West India Regiment, by acute dysentery, while on detachment at Accra.

The average strength of the black troops was 924; the admissions into hospital among them were 1,146, and the deaths 27, being in the ratio of 1,240 and 29·12 per 1,000 of mean strength.

The distribution of the force, and the sickness and mortality in each of the subordinate Commands are shown in the following Table:—

	Average Strength.	Admissions into Hospital.	Deaths	Ratio per 1,000 of Strength.		1859–67. Ratio per 1,000.	
				Admitted	Died.	Admitted	Died.
Sierra Leone ..	438	465	14	1061·7	31·96	990·8	29·15
The Gambia ..	166	135	5	813·2	30·11	1170·0	33·20
Lagos, and The Gold Coast	320	546	8	1706·3	25·00	1478·9	47·44

The admissions and deaths were considerably lower than in 1867, but did not differ materially from the average of the last nine years, except at the Gold Coast and Lagos, where the former were much above and the latte greatly under the average.

The following Table, framed from Abstract No. 17 in the Appendix, shows the influence of the different classes of diseases upon the troops:—

Orders.	Diseases.	Sierra Leone. Strength 438. 1868. Admitted.	1868. Died.	1868. Annual Ratio per 1,000. Admitted.	1868. Annual Ratio per 1,000. Died.	1859–67. Annual Ratio per 1,000. Admitted.	1859–67. Annual Ratio per 1,000. Died.	Gambia. 166. 1868. Admitted.	1868. Died.	1868. Annual Ratio per 1,000. Admitted.	1868. Annual Ratio per 1,000. Died.	1859–67. Annual Ratio per 1,000. Admitted.	1859–67. Annual Ratio per 1,000. Died.	Gold Coast and Lagos. 320. 1868. Admitted.	1868. Died.	1868. Annual Ratio per 1,000. Admitted.	1868. Annual Ratio per 1,000. Died.	1859–67. Annual Ratio per 1,000. Admitted.	1859–67. Annual Ratio per 1,000. Died.
	Class I.																		
1	Miasmatic Diseases	155	3	353·9	6·85	279·0	5·47	53	..	319·2	..	496·0	4·40	199	4	621·9	12·50	696·0	24·10
3	Enthetic ,,	130	..	296·8	..	270·0	·26	30	..	180·7	..	232·0	1·60	78	..	243·7	..	231·6	..
2	Dietic ,,	..	..	..	..	1·3	·52	..	..	..	..	2·8	..	3	..	9·4	..	3·5	·23
4	Parasitic ,,	6	..	13·7	..	41·1	..	..	..	..	..	15·6	..	39	..	121·9	..	99·3	..
	Class II.																		
1	Diathetic Diseases	5	..	11·4	..	4·4	..	..	..	..	..	10·0	1·60	3	..	9·4	..	11·0	·70
2	Tubercular ,,	16	7	36·5	15·98	17·6	8·07	3	1	18·1	6·02	11·2	7·20	7	1	21·9	3·12	14·0	6·55
	Class III.																		
	Diseases of the—																		
1	Nervous System	2	1	4·6	2·28	13·0	1·82	2	1	12·0	6·02	13·6	1·60	9	3	28·1	9·38	20·6	2·34
2	Circulatory ,,	2	..	4·6	..	2·3	..	3	..	18·1	..	1·6	·80	1	..	3·2	..	1·4	·93
3	Respiratory ,,	27	1	61·6	2·28	67·7	4·95	12	2	72·3	12·05	108·4	8·40	59	..	184·4	..	67·8	5·14
4	Digestive ,,	9	2	20·5	4·57	30·4	4·68	4	1	24·1	6·02	34·8	2·40	28	..	87·5	..	39·3	1·64
5	Urinary ,,	1	..	2·3	..	3·3	·52	..	..	..	..	7·6	·80	2	..	6·2	..	5·8	·45
6	Reproductive ,,	8	..	18·3	..	14·5	..	1	..	6·0	..	15·2	..	7	..	21·9	..	14·3	..
7	Locomotive ,,	3	..	6·9	..	13·2	·26	1	..	6·0	..	8·4	·40	1	..	3·2	..	9·1	·46
8	Integumentary ,,	78	..	178·1	..	159·6	..	19	..	114·5	..	130·3	..	54	..	168·7	..	175·0	..
	Class IV.																		
4	Diseases of Nutrition	..	..	..	..	1·3	·26	..	..	..	..	1·6	..	2	..	6·2	..	1·1	·23
	Class V.																		
1	Accidents	22	..	50·2	..	57·5	·78	7	..	42·2	..	65·6	..	54	..	168·7	..	77·6	2·34
2	Battle	..	..	..	..	9·6	·78	..	..	..	..	9·6	1·60	..	..	..	..	3·9	·23
3	Homicide	..	..	..	..	..	..	..	..	..	..	·3	·40	..	..	..	..	..	·46
4	Suicide	..	..	..	..	·2	·78	..	..	..	..	·3	1·20	..	..	..	..	..	·70
5	Execution	..	..	..	..	..	..	..	..	..	..	..	·40	..	..	..	..	..	·70
6	Corporal Punishment	..	..	..	..	4·1	..	..	..	..	..	2·4	..	..	..	..	..	6·7	..
	Cause not specified	1	..	2·3	..	·7	..	..	..	..	..	2·7	·40	..	..	..	..	·7	·23
	Total	465	14	1061·7	31·96	990·8	29·15	135	5	813·2	30·11	1170·0	33·20	546	8	1706·3	25·00	1478·9	47·44

Western Africa.

Compared with the results for 1867 this Table shows a marked decrease at Sierra Leone in the admissions and deaths by miasmatic diseases, and in the admissions by venereal diseases and those of the digestive system; at the Gambia, in the admissions by venereal diseases, and in the deaths by miasmatic and tubercular, and at the Gold Coast and Lagos, in the deaths by miasmatic and tubercular, and in the admissions by miasmatic and venereal diseases, but this decrease in the admissions at the latter stations has been to a great extent counter-balanced by an increase in diseases of the respiratory and digestive systems and in accidents.

Compared with the average of the last nine years the most striking points are the increase in the amount of, and mortality by, tubercular diseases at Sierra Leone, the decrease in miasmatic and venereal diseases at the Gambia, and the increase of diseases of the respiratory and digestive systems and of accidents at the Gold Coast, but with a marked decrease in the mortality, particularly by miasmatic diseases.

MIASMATIC DISEASES when subdivided give the following results :—

Diseases.	Sierra Leone.			The Gambia.			The Gold Coast. and Lagos.		
	Admitted in 1868.	Ratio per 1,000 Admitted.		Admitted in 1868.	Ratio per 1,000 Admitted.		Admitted in 1868.	Ratio per 1,000 Admitted.	
		1868.	1859-67.		1868.	1859-67.		1868.	1859-67.
Eruptive Fevers	..	..	13·5	1	6·0	27·2	1	3·1	3·3
Paroxysmal „	69	157·6	159·4	10	60·2	287·5	108	337·5	369·4
Continued „	..	..	2·0	..	..	4·4	..	..	1·2
Dysentery and Diarrhœa ..	9	20·5	36·5	13	78·3	84·7	42	131·2	226·9
Sorethroat and Influenza ..	5	11·4	6·4	6	36·1	13·2	6	18·7	8·4
Ophthalmia	9	20·5	15·5	3	18·1	17·6	8	25·0	19·4
Rheumatism	59	134·7	64·9	18	108·4	58·0	27	84·4	56·8

Eruptive Fevers.—The troops were remarkably exempt from this group of diseases, only two admissions having taken place, one by small-pox in a very modified form at the Gambia, and the other by measles at Cape Coast Castle.

Paroxysmal Fevers were considerably less prevalent than in 1867 at Sierra Leone and on the Gold Coast, but did not differ materially from the average of these stations; at the Gambia, however, while they showed a moderate reduction compared with the preceding year, they did not amount to one-fourth of the average of the last nine years.

Dysentery and Diarrhœa were much less prevalent than usual on the Gold Coast, and although *cholera* was prevailing as an epidemic at Senegal during the latter part of the year, it did not then extend to St. Mary's, Gambia.

Rheumatism was greatly in excess of the average at all the stations, although at the Gambia there was a considerable decrease on the proportion in the preceding year.

ENTHETIC DISEASES were much less prevalent at all the stations than in 1867, but did not differ materially from the average, except at the Gambia, where the ratio was 51 per 1,000 below it.

PARASITIC DISEASES.—The marked reduction in this class of diseases which was noted in 1867, continued during the year under review at Sierra Leone, but on the Gold Coast Guinea worm again prevailed among the troops, raising the ratio to 122 per 1,000. The cases, amounting to 31, all occurred in the 2nd West India Regiment. The Medical Officer in charge was unable to account for their prevalence.

TUBERCULAR DISEASES were the cause of a high rate of mortality, especially at Sierra Leone, where they gave rise to half the deaths during the year.

DISEASES OF THE RESPIRATORY SYSTEM show a very great increase upon

the high rates of the preceding year on the Gold Coast. The excess was due to Bronchitis in August and September. No special reason has been assigned for the increase. *Western Africa.*

Diseases of the Digestive System also were unusually prevalent on the Gold Coast, the causes of the excess being colic and constipation, attributed to irregularity of diet.

There were no deaths from accidents or violence in the Command during the year. A man of the 2nd West India Regiment had his arm so much injured, while firing a salute, as to render amputation necessary.

The invaliding from Western Africa has already been shown in connection with that from the West Indies. *Invaliding.*

SANITARY REPORT.

The Principal Medical Officer reports:—

"The health of the troops at the Gambia has been exceptionally good during the year, the number of admissions per 1,000 being less than the average of the last ten years. I cannot offer any suggestions calculated to improve the health of the troops. No alterations of a sanitary nature have been effected. The means of ablution and cooking, the scale of diet, and the clothing of the troops, remain unchanged since last report. The drainage is as good as the level nature of the ground will admit of. Five additional jalousies have been added to the upper story of the hospital."

Section III.

Mean Daily Sick.

The average daily sick in hospital, during the year, amounted in Sierra Leone to 21, at the Gambia to 8, and on the Gold Coast and at Lagos to 25. The following Table shows the information deduced from these numbers:—

		Sierra Leone.	The Gambia.	The Gold Coast and Lagos.
Ratio per 1,000 constantly Sick ..	1868 ..	47·94	48·19	78·12
	1861–67..	44·42	48·99	62·11
		days..	days.	days.
Average Sick Time to each soldier ..	1868 ..	17·50	17·59	28·52
	1861–67..	16·21	17·88	22·67
Average Duration of Cases of Sickness	1868 ..	16·48	21·63	16·71
	1861–67..	14·89	13·84	14·07

The mean daily sick on the Gold Coast was considerably higher than in 1867; at the other two stations the ratio was nearly the same as in that year. The same remark applies to the average sick time to each soldier, but the average duration of the cases was higher at all these stations.

VI.—ON THE HEALTH OF THE TROOPS SERVING IN THE ISLAND OF ST. HELENA.

Section I.

Sickness and Mortality.

STATISTICAL REPORT.

St. Helena. The garrison during the year consisted of a battery of Royal Artillery, a company of Royal Engineers, and four companies of a regiment of the Line, detached from the Cape of Good Hope. In the middle of November a detachment of the 99th was relieved by one of the 1st Battalion 9th Regiment.

The average strength of the troops were 421; there were 383 admissions into hospital, and 2 deaths, being in the ratio of 910 and 4·75 per 1,000 of the strength, the former considerably above, and the latter a little under, the proportion in the preceding year.

The diseases by which the sickness and mortality were caused are stated in detail in Abstract No. 19 in the Appendix; the classified results are shown in the following Table:—

Order.	Diseases.	Strength, 421. Admitted.	Died. At St. Helena.	Died. Of Invalids.	Died. Total.	Ratio per 1,000 of Strength. 1868. Admitted.	1868. Died.	1859–67. Admitted.	1859–67. Died.
	Class I.								
1	Miasmatic Diseases ..	83	..	..	..	197·2	..	288·1	2·18
2	Enthetic „ ..	142	..	..	..	337·3	..	135·2	..
3	Dietic „ ..	11	..	..	..	26·1	..	38·8	·22
4	Parasitic „ ..	3	..	..	..	7·1	..	5·2	..
	Class II.								
1	Diathetic Diseases ..	1	..	..	..	2·4	..	4·3	·22
2	Tubercular „	8	..	..	..	19·0	..	6·0	1·52
	Class III. Diseases of the—								
1	Nervous System ..	10	2	..	2	23·8	4·75	27·2	1·30
2	Circulatory „ ..	10	..	..	..	23·8	..	10·7	·65
3	Respiratory „ ..	6	..	..	..	14·2	..	40·7	1·09
4	Digestive „ ..	22	..	..	..	52·3	..	53·5	·43
5	Urinary „ ..	2	..	..	..	4·7	..	3·9	..
6	Reproductive „ ..	7	..	..	..	16·6	..	5·2	..
7	Locomotive „ ..	..	..	..	..	..	..	2·1	..
8	Integumentary „ ..	36	..	..	..	85·5	..	63·0	..
	Class IV.								
4	Diseases of Nutrition ..	3	..	..	..	7·1	..	·2	..
	Class V.								
1	Accidents	39	..	..	..	92·6	..	134·0	1·52
4	Suicide	..	..	..	..	..	..	·4	·22
6	Corporal Punishment ..	..	..	..	..	..	..	1·5	..
	Diseases not specified ..	..	..	..	..	..	..	2·6	..
	No appreciable disease ..	..	..	..	..	..	..	·4	..
	Total	383	2	..	2	909·7	4·75	823·0	9·35

The admissions have been considerably above the average and greatly higher than in 1867, the increase being chiefly in enthetic diseases.

Miasmatic Diseases though slightly higher than in 1867 were much below the average. When subdivided they give the following results :—

Diseases.	Admitted.	Died.	Ratio per 1,000 of Mean Strength. 1868. Admitted.	1868. Died.	1859–67. Admitted.	1859–67. Died.
Eruptive Fevers	..	..	..	..	..	..
Paroxysmal „	1	..	2·4	..	18·7	·21
Continued „	8	..	19·0	..	90·1	·87
Dysentery and Diarrhœa ..	31	..	73·6	..	76·2	·87
Sorethroat and Influenza ..	5	..	11·9	..	21·3	..
Ophthalmia	5	..	11·9	..	26·5	..
Rheumatism	32	..	76·0	..	28·1	..

All the diseases in this class have been under the average, except rheumatism. The reduction, however, in dysentery and diarrhœa has been very

St. Helena. trifling, and they were three times as prevalent as in 1867. The admissions from rheumatism were very numerous, but no reason for the increase has been assigned by the Medical Officer in charge.

ENTHETIC DISEASES were greatly above the average, although it is stated that "the Prevention of Diseases Act is in force." The increase has been nearly alike in syphilis and gonorrhœa. It is in this class of diseases that the great increase in the admissions has taken place.

INVALIDING.—Twenty-six invalids were sent to England from St. Helena during the year, and 17 were finally discharged the service at Netley, being respectively in the ratio of 61·75 and 40·38 per 1,000 of mean strength. The following Table, framed from Abstract No. 20 in the Appendix, shows the classes of diseases by which the invaliding was caused.

Diseases.	Invalids Sent Home from St. Helena.	Discharged the Service at Invalid Depôt.
Chronic Dysentery	2	..
Chronic Rheumatism	4	2
Secondary Syphilis	1	1
Tubercular Diseases	4	1
Diseases of the—		
Nervous System	1	..
Circulatory „	7	6
Digestive „	4	3
Reproductive „	1	..
Locomotive „	..	1
Diseases of Nutrition	2	2
Accidents	..	1
Total	26	17
Ratio per 1,000 of Mean Strenth {1868 ..	61·76	40·38
{1860-67 ..	34·14	14·29

The invaliding was considerably above the average, but in so small a force fluctuations in this respect may be naturally expected. Diseases of the circulatory system furnished a larger number of invalids than any of the other classes. Four cases of valve disease of the heart were invalided from the Royal Engineers. This is attributed by the Medical Officer in charge partly to the nature of their employment and partly to their being quartered at Ladder Hill Barracks, while their workshops are in James Town, involving daily a fatiguing hilly walk to and from their work.

Mean Daily Sick. The average daily sick in hospital amounted to 19, or 45·13 per 1,000 of mean strength. The mean sick time to each soldier was 16·47 days, and the average duration of the cases in hospital was 18·11 days. These results are considerably higher than in 1867, but do not differ materially from the average.

SANITARY REPORT.

The Principal Medical Officer reports that, although the average mortality of the troops at St. Helena will bear favourable comparison with the death rate of any other tropical station, yet the return does not show that amount of health and efficiency which ought to obtain in such a climate as this island affords. This, he thinks, is mainly attributable to the hot, close, and confined valley position of James Tower Barracks. Both on hygienic and moral grounds, advantage should be taken of the uplands, where the climate is pure and invigorating, for the erection of suitable barrack and hospital accommodation. By removing the troops from the enervating influences of the town to the more bracing climate of the hills, the tone and morals of the men would be raised, the standard of health and efficiency much increased, and the necessity for invaliding proportionately diminished. The measure would, moreover, prove to be one also of financial expediency.

VII.—ON THE HEALTH OF THE TROOPS SERVING AT THE CAPE OF GOOD HOPE.

Section I.

Sickness and Mortality.

STATISTICAL REPORT.

In the middle of January the 1st Battalion 10th Regiment embarked for *Cape of Good Hope.* Japan, and in the end of November the 32nd Regiment arrived from the Mauritius for service at the Cape.

The average strength of the troops during the year was 3,630; the admissions into hospital were 4,027, and the deaths were 44, of which 31 occurred in, and 10 out of hospital, and 3 among invalids on their passage home and at Netley. The ratio of admissions therefore was 1,109, and of deaths 12·11 per 1,000 of mean strength; the former under and the latter slightly above the proportion in the preceding year.

The admissions and deaths in each corps during the year were as follows:—

	Average Annual Strength.	Admissions into Hospital.	Deaths.				Annual Ratio per 1,000 of Mean Strength.	
			In Hospital.	Out of Hospital.	Of Invalids.	Total.	Admitted.	Died.
Royal Artillery	186	275	..	..	..	..	1478·4	..
Royal Engineers ..	235	214	3	..	..	3	910·6	12·76
1st Bn. 9th Regiment..	710	748	5	3	..	8	1053·5	11·26
1st Bn. 10th „ ..	34	6	2	..	..	2	176 5	58·82
2nd Bn. 11th „ ..	701	881	7	6	1	14	1256·8	19·97
2nd Bn. 20th „ ..	727	670	5	..	..	5	921·6	6·87
32nd Regiment	68	112	..	..	..	..	1647·0	..
99th „ Rt. Wing	376	633	2	..	1	3	1683·5	7·97
Cape Mounted Rifles ..	466	493	6	1	1	8	1057·9	17·16

The other death was that of a man of the Army Hospital Corps.

The admissions were extremely high in the right wing 99th Regiment at Cape Town, from the great prevalence of venereal diseases. The ratio was also very high in the 32nd Regiment during the short period it was in the Command, chiefly from the occurrence of cases of paroxysmal fevers, the result of the previous service of the corps in the Mauritius.

The diseases by which the sickness and mortality were caused are detailed in Abstract No. 19 in the Appendix. The following Table shows the classified results.

Cape of Good Hope.

Order.	Diseases.	1868. Mean Strength, 3,630. Admitted.	Deaths. At Cape.	Deaths. Of Invalids.	Deaths. Total.	Ratio per 1,000 Admitted.	Ratio per 1,000 Died.	1859–67. Ratio per 1,000 of Mean Strength. Admitted.	Died.
	Class I.								
1	Miasmatic Diseases ..	920	5	..	5	253·5	1·38	278·4	2·51
2	Enthetic „ ..	1,338	1	..	1	368·6	·27	270·1	·08
3	Dietic „ ..	113	2	..	2	31·1	·55	15·8	·43
4	Parasitic „ ..	21	..	..	..	5·8	..	10·6	..
	Class II.								
1	Diathetic Diseases ..	9	..	..	..	2·5	..	4·0	·05
2	Tubercular „ ..	41	10	1	11	11·3	3·03	9·5	1·47
	Class III. Diseases of the—								
1	Nervous System ..	108	6	1	7	29·8	1·93	24·3	1·20
2	Circulatory „ ..	33	2	1	3	9·1	·83	17·4	1·82
3	Respiratory „ ..	139	6	..	6	38·3	1·65	47·8	·88
4	Digestive „ ..	199	2	..	2	54·8	·55	47·5	·77
5	Urinary „ ..	14	1	..	1	3·9	·27	2·1	·11
6	Reproductive „ ..	65	..	..	..	17·9	..	11·4	..
7	Locomotive „ ..	27	..	..	..	7·4	..	4·6	..
8	Integumentary „ ..	513	..	..	..	141·3	..	114·5	..
	Class IV.								
4	Diseases of Nutrition ..	19	..	..	..	5·2	..	1·4	..
	Class V.								
1	Accidents	462	3	..	3	127·3	·83	95·2	1·34
3	Homicide	..	1	..	1	..	·27	..	·08
4	Suicide	3	2	..	2	·8	·55	..	·16
5	Execution	..	..	..	..	..	..	..	·02
6	Corporal Punishment ..	3	..	..	..	·8	..	3·3	..
	Diseases not specified ..	..	..	..	..	..	..	4·5	..
	Total	4,027	41	3	44	1109·4	12·11	962·4	10·92

The admissions though lower than in 1867 have been above the average of the last nine years. The decrease upon the results of the preceding year has been chiefly in miasmatic and enthetic diseases; the excess above the average has been in enthetic diseases and those of the integumentary system, and in accidents.

Miasmatic Diseases.—The admissions and deaths by the principal diseases of this class were as follows:—

Diseases.	Admitted	Died.	Annual Ratio per 1,000 of Strength. 1868. Admitted	1868. Died.	1859–67. Admitted	1859–67. Died.
Eruptive Fevers	2	..	·5	..	1·1	·03
Paroxysmal „	82	1	22·6	·27	16·7	·08
Continued „	183	1	50·4	·27	45·5	1·21
Dysentery and Diarrhœa ..	66	3	18·2	·83	41·9	1·10
Sorethroat and Influenza ..	95	..	26·1	..	24·1	..
Ophthalmia	257	..	70·8	..	81·7	..
Rheumatism	213	..	58·7	..	45·9	..

Parozysmal Fevers.—The increase in fevers of this type was entirely due to the arrival of the 32nd Regiment from Mauritius, 49 cases having occurred in that corps alone during the six weeks it was stationed at the Cape. *Cape of Good Hope.*

Continued Fevers were also above the average, though less prevalent than in 1867. The corps which furnished the highest proportion of cases were the 2nd Battalion 20th Regiment in Natal, and the right wing 99th at Cape Town. In the latter instance their prevalence was believed to be in a great measure the result of the very insanitary condition of the town.

Dysentery and Diarrhœa show a very satisfactory reduction in amount. Of the 66 admissions 10 were from dysentery and the rest from diarrhœa.

Ophthalmia also has been much lower than in 1867, and 11 per 1,000 under the average of the last nine years, but it is still a cause of very considerable inefficiency. The Cape Mounted Rifles had the greatest number of cases, and in the 1st Battalion 9th, and 2nd Battalion 20th Regiments, the admissions were greatly above the average.

Enthetic Diseases were considerably less prevalent than in 1867, but still very much above the average. The reduction, though not exclusively, has been chiefly in the syphilitic group of these diseases. The corps which furnished much the highest proportion of cases was the right wing of the 99th at Cape Town, which in an average annual strength of 376 men had 326 admissions by this class of diseases; next to it stand the 2nd Battalion 11th Regiment at Graham's Town, which had 311 cases in a strength of 701 men, and the 1st Battalion 9th at King William's Town, which in the preceding year had suffered so much from it at Cape Town, and in the year now under review had 271 cases in an average strength of 710. In the Artillery also the proportion of cases was high, but in the Engineers, the 2nd Battalion 20th Regiment, and the Cape Mounted Rifles, the proportion was moderate.

The other classes of diseases do not seem to require special comment.

SANITARY REPORT.

Deputy Inspector-General Grant reports:—

"The prevailing diseases, and those by which invaliding has been chiefly occasioned, have been venereal, rheumatism, and diseases of the circulation. The two first are probably associated with each other, and a diminution of their frequency may be expected when the Contagious Diseases Act now contemplated shall have come into operation. Another cause of rheumatism, however, especially at the upper stations, is the changes of temperature which are frequently both marked and sudden. The barracks are for the most part old and without fire-places; some of them were not built originally as barracks, but converted from stables, and others were built by the Dutch, and they are all without fire places. I strongly recommend that stoves or fire-places be introduced into all barrack-rooms in the Command. Constant fires are not necessary, but such an issue of fuel should be made to corps at all seasons of the year as would admit of occasional fires whenever they seemed necessary to the Commanding Officer and Surgeon. This would add materially to the comfort, and would also, I believe, tend to improve the health of the men.

Without detailing the exact superficial and cubic space per man in the different barracks in the command, I may say that it is in many cases too limited. During the hot season, tents have been pitched where necessary to relieve the barrack rooms. The barrack of the Cape Mounted Rifles, and the hospital at King William's Town, are unfit for occupation.

I recommend the adoption of the dry earth system in the latrines, water not being available.

Increased means of out-door amusement are required, and each barrack ought to have a racket court and covered skittle alley. The meat issued to the troops is very inferior to that issued in England, and the men have less facility of buying extras, such as fish, bacon, &c., at a cheap rate. Vegetables also are often very scarce and dear, but butcher's meat is cheap. His Excellency the Lieutenant-General Commanding remarked upon the small bulk of the men's messes at his inspection, and observed that a scanty supply of food in all probability caused a craving for intoxicating drinks; in which opinion I fully concur."

Cape of Good Hope.

Section II.

On the Extent of Invaliding.

During the year 197 men were sent from the Cape to England as invalids; one man was discharged the Service in the Colony, and 95 men were finally discharged at Netley. These numbers give the proportion of 43·1 per 1,000 of the strength invalided to England, and 26·5 per 1,000 discharged the Service.

The disabilities for which the men were sent home and were discharged are stated in Abstract No. 20 in the Appendix, from which the following classified summary has been made :—

Disabilities.	Invalids sent to England.	Invalids Discharged the Service.	
		At the Cape.	At Netley.
Dysentery and Diarrhœa	4	..	1
Erysipelas	1	..	..
Ophthalmia..	23	..	7
Rheumatism	23	..	5
Venereal Diseases	25	..	9
Dietic „	1	..	..
Diathetic „	3	..	..
Tubercular „	21	..	18
Diseases of the—			
Nervous System	18	1	13
Circulatory „	23	..	22
Respiratory „	4	..	1
Digestive „	10	..	8
Urinary „	1	..	1
Reproductive „	..	..	1
Locomotive „	9	..	4
Integumentary „	7	..	1
Diseases of Nutrition	12	..	1
Accidents and Violence	12	..	3
Total	197	1	95
Ratio per 1,000 of Mean Strength .. .. { 1868 ..	43·1	·3	26·2
{ 1861-7	26·9	2·1	19·1

The numbers sent home were greatly in excess of the average. The increase was chiefly due to the 11th Regiment, which invalided a large number of men for hepatic disease and rheumatism, and to the wing of the 99th at Cape Town, among whose invalids syphilis was a prominent disability. Ophthalmia, rheumatism, and venereal diseases were the disabilities in which the increase was most marked. Diseases of the circulatory system also showed a marked increase compared with the amount in the preceding year.

Section III.

Mean Daily Sick.

The mean daily sick of the troops at the Cape during the year amounted to 229, being in the proportion of 60·61 per 1,000 of mean strength, a fraction lower than in 1867, but very considerably above the average of the last eight years.

The following Table gives the usual information on this head :—

Cape of Good Hope.

	1868.	1860–67.
Ratio per 1,000 of Strength constantly Sick	60·61	50·69
Average Sick time to each Soldier	days. 22·12	days. 18·50
Average duration of cases of Sickness	19·94	19·36

Compared with 1867 there has been a slight decrease in the mean sick, and an increase in the duration of the cases. The mean sick and average sick time to each soldier have been much above the average of the last eight years, but the duration of the cases has experienced an increase of only about half-a-day.

Section IV.

On the Influence of Age on the Mortality.

The following Table, framed from Abstract No. 21 in the Appendix, shows the ratio of mortality at different ages, in quinquennial periods, among the troops which served during the whole year at the Cape of Good Hope:—

		Under 20	20 and under 25.	25 and under 30.	30 and under 35.	35 and under 40.	40 and upwards.
Ratio of Deaths per 1,000 living ..	1868 ..	3·01	7·29	11·03	15·65	19·69	61·23
	1859–67	2·79	7·48	11·75	14·70	18·97	35·86

The results for 1868 differ very slightly from the average of the preceding nine years, except at the age of 40 and upwards, but the very small number under observation in that group sufficiently explains the irregularity in the results.

VIII.—ON THE HEALTH OF THE TROOPS SERVING IN THE ISLAND OF MAURITIUS.

Section I.

Sickness and Mortality.

STATISTICAL REPORT.

Mauritius. At the beginning of the year the garrison consisted of two batteries Royal Artillery, a company of Royal Engineers, the 32nd and the 86th Regiments, the latter having landed in the Island on the 30th of December, 1867. In the middle of August half of the Artillery was withdrawn, and in the middle of November the 32nd Regiment embarked for the Cape of Good Hope.

The average strength of the troops for the year was 1,318; the admissions into hospital were 3,079, and the deaths 36, including 4 among invalids. These numbers give the proportion of 2,336 cases and 27·31 deaths per 1,000 of mean strength, the former being higher and the latter one-third less than in the preceding year.

The sickness and mortality in each corps were as follows:—

	Average *Annual* Strength.	Admissions into Hospital.	Deaths.				Ratio per 1,000.	
			In Hospital.	Out of Hospital.	Of Invalids.	Total.	Admitted.	Died.
Royal Artillery.. ..	100	444	4	..	1	5	4,440	50·00
Royal Engineers ..	26	100	3	..	..	3	3,846	115·38
32nd Regiment ..	543	568	15	1	1	17	1,046	31·31
86th „ ..	616	1,957	8	1	2	11	3,177	17·86

The Ordnance Corps had the highest ratio of admissions and deaths. Of the two Line Regiments the 86th, which had just arrived in the Command, had much the highest proportion of cases but the lowest of deaths.

The following Table, framed from Abstract No. 19 in the Appendix, shows the admissions and deaths by the different classes of diseases :—

Order.	Diseases.	Strength 1,318. Admitted.	Deaths. At Mauritius.	Deaths. Of Invalids.	Deaths. Total.	1868. Ratio per 1,000. Admitted.	1868. Ratio per 1,000. Died.	1859–67. Ratio per 1,000. Admitted.	1859–67. Ratio per 1,000. Died.
	Class I.								
1	Miasmatic Diseases ..	2,585	22	..	22	1961·3	16·69	426·5	12·07
2	Enthetic „ ..	119	..	..	..	90·3	..	121·0	..
2	Dietic „ ..	23	..	..	..	17·4	..	22·6	·19
4	Parasitic „ ..	7	..	..	..	5·3	..	6·2	..
	Class II.								
1	Diathetic Diseases ..	15	..	..	..	11·4	..	2·5	..
2	Tubercular „ ..	14	..	1	1	10·6	·76	9·7	2·27
	Class III. Diseases of the—								
1	Nervous System ..	22	2	..	2	16·7	1·52	19·5	1·01
2	Circulatory „ ..	10	1	2	3	7·6	2·27	9·1	·57
3	Respiratory „ ..	23	2	..	2	17·4	1·52	46·5	·63
4	Digestive „ ..	69	2	1	3	52·4	2·27	69·0	1·45
5	Urinary „ ..	3	..	..	..	2·3	..	2·4	·06
6	Reproductive „ ..	12	..	..	..	9·1	..	11·6	..
7	Locomotive „ ..	14	..	..	..	10·6	..	5·0	..
8	Integumentary „ ..	80	..	..	..	60·7	..	98·0	·06
	Class IV.								
4	Diseases of Nutrition	8	..	..	..	6·1	..	7·3	·13
	Class V.								
1	Accidents	74	2	..	2	56·1	1·52	66·4	·88
4	Suicide	1	1	..	1	·8	·76	·3	·76
6	Corporal Punishment	..	..	..	..	..	..	3·1	..
	No appreciable disease	..	..	..	..	..	..	·3	..
	Diseases not specified	..	..	..	..	..	..	3·6	..
	Total ..	3,079	32	4	36	2336·1	27·31	930·6	20·08

The excess of the admissions, compared with 1867, and the great reduction in the proportion of deaths occurred chiefly in the class of miasmatic diseases.

MIASMATIC DISEASES when subdivided give the following results:—

Diseases.	Admitted.	Died.	Ratio per 1,000 of Mean Strength. 1868. Admitted	1868. Died.	1859–67. Admitted	1859–67. Died.
Eruptive Fevers	..	..	..	..	..	..
Paroxysmal „	2,359	18	1789·8	13·65	135·3	1·68
Continued „	6	1	4·6	·76	71·1	1·93
Dysentery and Diarrhœa ..	137	3	103·9	2·28	130·5	3·61
Spasmodic Cholera	..	..	..	..	11·1	4·24
Sorethroat and Influenza ..	6	..	4·6	..	8·8	..
Ophthalmia	14	..	10·6	..	31·0	..
Rheumatism	53	..	40·2	..	24·9	..

Paroxysmal Fevers have caused upwards of nine-tenths of the whole of the admissions by this class. This has been due to the continued prevalence of the epidemic malarious fever, of which an account was given in the last volume of these Reports. It was then stated that the disease, after having diminished

Mauritius. till October, began to increase in frequency as the summer advanced. The increase continued during January 1868, in which month the disease reached its maximum, when it again declined till December, with the exception of a slight increase in May and October.

The following Table shows the progress of the disease during the year under review :—

1868.	Strength on 1st of Month.	Intermittent and Remittent Fevers.	
		Admitted.	Died.
January	1,507	503	3
February	1,504	389	4
March	1,499	328	..
April	1,495	195	2
May	1,495	243	4
June	1,488	176	2
July	1,481	142	2
August	1,480	96	1
September	1,084	76	..
October	1,084	83	..
November	1,081	40	..
December	616	88	..

It will be observed that the epidemic reached its height in January, whereas in 1867 it continued to increase till May, and that the minimum of admissions was in November, while in the preceding year it occurred in October.

The prevalence of malarious fevers in the different corps is shown in the following Table :—

	Average *Annual* Strength.	Intermittent and Remittent Fevers.		Ratio per 1,000 of Mean *Annual* Strength.		Period of Observation.
		Admitted.	Died.	Admitted.	Died.	
Royal Artillery	100	375	3	3,750	30·00	12 months.
„ Engineers.. ..	26	90	2	3,462	76·92	12 „
32nd Regiment	543	350	6	645	11·05	10½ „
86th „	616	1,538	7	2,497	11·36	12 „

Of these Corps, half of the Royal Artillery arrived in the Command in 1864, and the other half in December 1867, and the latter was also the date of arrival of the Royal Engineers and 86th Regiment; the 32nd landed in July 1867. The Royal Artillery and Engineers were quartered in Fort George; the 32nd Regiment at Mahebourg, with a detachment at Port Louis; and the 86th at Flacq, with detachments at Cannonier Point, Grand River, Pointe D'Essnay, Reduit and Port Louis till the middle of November, when it moved to Mahebourg, on the embarkation of the 32nd Regiment. The 86th Regiment on first landing was detained at Port Louis for 16 days, and to this the Medical Officer in charge attributes much of the subsequent prevalence of fever in the corps, Port Louis being at the time the centre of the epidemic. The relative exemption of the 32nd Regiment was probably due to its being quartered at Mahebourg, which during the preceding year was remarkably free from fever, most of the cases which then occurred at it having been contracted at Port Louis. The very high ratio of mortality in the Ordnance, but

especially in the Royal Engineers, may be deemed a result of the very small number of men under observation. We are unable, from defects in the Returns, to present a complete tabular statement of the number of cases of fever at each station, but from a careful examination of the documents it appears that at Mahebourg the proportion per 1,000 of the strength was about 430; at none of the other stations did the admissions amount to less than double the strength. *Mauritius.*

Rheumatism was the only other disease of this class which exceeded the average. Four-fifths of the cases occurred in the 86th Regiment. No explanation of its prevalence in this corps in given by any of the Medical Officers.

ENTHETIC and DIETIC DISEASES were below the average, and the latter especially much lower than in the preceding year. There was an increase in the amount of DIATHETIC DISEASES caused by the occurrence of eleven cases reported as *anæmia*, the result of malarious fever. None of the other classes seem to require special comment.

SANITARY REPORT.

Deputy Inspector-General Reid reports:—

"Malarious exhalations, intensified by other local influences, have formed the principal cause, and that a very potent one, of sickness, invaliding, and non-effectiveness among the troops serving in Mauritius during 1868.

In Port Louis, and at all the out-posts where troops were stationed, the most scrupulous cleanliness within and without the barracks has been practised, the drainage attended to, weeds and shrubs kept down, garbage collected and burnt, carbolic acid used when required to arrest fermentation or putrefaction in places which admitted of no other means; and in short, all the sanitary and hygienic measures which were practicable were carried out.

Flacq.—At Flacq the ventilation of the barrack rooms is now being improved, and there is a promise of sanitary works on a larger scale than has hitherto been possible; though there is thus far no improvement in the neighbouring marsh.

Mahebourg—At Mahebourg the sources of unhealthiness are neither so numerous nor so potent as many suppose, and the principal one is the bight of the river close to the barracks, occasioned and kept up mainly by the military occupation. It has been frequently referred to in special reports; and might have been gradually and effectually remedied by fatigue parties, as I took occasion to recommend, but hitherto very little has been done (of late years) with that object. During 1868, however, the odours from the men's privies adjoining it have ceased to be contributed to that nuisance, by the change to the charcoal tub system and removal of the resulting matter to a distance.

Port Louis.—The ventilation of the men's rooms at the Citadel has been much benefited by shafts passing through the bomb-proof roof; and although temporary inconvenience and perhaps some additional sickness resulted from water entering through them, that drawback has now, I believe, been remedied. There exist no nuisances in or close to the Citadel.

As regards the town of Port Louis, in which and its environs the principal military accommodation exists, and where a limited number of men and officers must of necessity be stationed, not a little has been done in the way of sanitary improvement; good results may be expected from the honest and intelligent, as well as stringent working of a recent building act. Most of the minor sanitary works connected with the eastern shore of that hot-bed of fever, the large lagoon called the "Mêr Rouge," were damaged or carried away by the floods of 1868, and little has been done in that locality of late. But there is a prospect of funds being soon available and of permanent sanitary works (of which certain plans and parts have lately been urgently recommended by the General Board of Health) being begun for its improvement.

Already some operations have been commenced at the Candan Basin, on the opposite side of the harbour and not far from the head-quarters of Royal Engineers and Royal Artillery, from which good results may be confidently expected.

But it must be kept in mind, as I have again and again submitted, that

Mauritius. after the most extensive sanitary works, which it will take years and vast sums to accomplish, Port Louis will always be an unhealthy station; and that the surest and readiest guarantee for the health and effectiveness of the garrison of Mauritius, and the most economical measure in the end, is the erection of huts or barracks close to railway communication on the dry, cool, and healthy plateau of Plaines Wilhems, whence the necessary force for Port Louis and the less unhealthy sea-board stations might be relieved weekly or monthly, and the men kept in vigour and good health thereby."

Section II.

On the Extent of Invaliding.

During the year there were 48 invalids sent to England and 25 were finally discharged the Service at Netley, being respectively in the ratio of 36·4 and 19·0 per 1,000 of mean strength.

The proportion of invalids sent home was much smaller than in 1867, but in the year under review 204 men were sent to the Cape in the middle of the year for change of climate in consequence of having suffered from fever, who might perhaps be fairly included with the invalids in estimating the influence of the climate on the troops.

The influence of the different classes of diseases in causing invaliding is shown in the following Table framed from No. 20 in the Appendix:—

Disabilities.	Invalids sent Home.	Discharged the Service at Netley.
Paroxysmal Fevers	31	4
Dysentery and Diarrhœa	2	..
Ophthalmia	1	2
Rheumatism	1	..
Venereal Diseases	1	2
Diathetic „	3	..
Tubercular „	4	10
Diseases of the—		
Nervous System	1	1
Circulatory „	..	4
Respiratory „	2	1
Integumentary „	..	1
Accidents and Violence	2	..
Total	48	25
Ratio per 1,000 of Mean Strength .. .. { 1868 ..	36·4	19·0
{ 1860-67 ..	43·3	16·7

As might have been expected under the circumstances, paroxysmal fevers gave rise to much the greatest proportion of invaliding to England. Tubercular diseases were the chief cause of final discharge from the Service.

Section III.

Mean Daily Sick.

The average number constantly non-effective from sickness during the year was 97, or 73·60 per 1,000 of mean strength, being much under the proportion

in 1867, but nearly double that of the preceding nine years. The following Table gives the usual information on this head :— *Mauritius.*

	1868.	1859–67.
Ratio per 1,000 of Strength constantly Sick	73·60	43·11
	Days.	Days.
Mean Sick-Time to each Soldier	24·86	15·73
Average duration of cases of Disease	11·50	16·91

In all these particulars there has been a reduction upon the results for 1867. The proportion constantly sick and the mean sick time to each soldier have been very much above, but the duration of the cases has been nearly five days and a half below the average.

Section IV.

Influence of Age on the Mortality.

The following Table shows the strength and deaths at each age in quinquennial periods of life, in those corps which served in the Mauritius during the whole of the year :—

Corps.	Under 20 Years.		20 and under 25.		25 and under 30.		30 and under 35.		35 and under 40.		40 and upwards.	
	Strength on 1st Jan.	Died.	Strength on 1st Jan.	Died.	Strength on 1st Jan.	Died.	Strength on 1st Jan.	Died.	Strength on 1st Jan.	Died.	Strength on 1st Jan.	Died.
Royal Artillery	8	...	42	2	25	...	31	2	13	...	6	1
,, Engineers	1	...	7	...	9	...	10	2	3	1	1	...
86th Regiment	55	...	257	2	208	5	113	1	38	3	...	...
Total	64	...	306	4	242	5	154	5	54	4	7	1
Ratio per 1,000 of Strength { 1868	...		13·07		20·66		32·47		74·07		143·85	
{ 1859–66 ...	9·14		15·90		16·42		23·56		26·24		28·57	

The numbers are too small to justify any positive deductions from them, but they tend to show that the epidemic of malarious fever has proved more fatal to the older soldiers, the mortality under 25 having been below the average of previous years.

IX.—ON THE HEALTH OF THE TROOPS SERVING IN THE ISLAND OF CEYLON.

Section I.

Sickness and Mortality.

STATISTICAL REPORT.

1.—WHITE TROOPS.

Ceylon. The only change during the year in the composition of the European Force stationed in the Island was the addition of the 7th Battery 2nd Brigade R.A., which arrived from Melbourne on the 6th October.

The average strength of these troops was 823, the admissions into hospital were 923, and the deaths 18, including 3 of invalids on their passage to England. These numbers show the ratio of admissions to have been 1,121, and of deaths 21·89 per 1,000 of mean strength, both in excess of the proportion in 1867, though under the average of the last nine years. The influence of the different classes of diseases on the sickness and mortality is shown in the following Table. The details for 1868 are given in Abstract No. 19 in the Appendix.

Orders.	White Troops ..	Strength, 823.				Annual Ratio per 1,000.			
			Died.			1868.		1859–67.	
	Diseases.	Admitted.	At Ceylon.	Of Invalids.	Total	Admitted.	Died.	Admitted.	Died.
	Class I.								
1	Miasmatic Diseases	372	9	1	10	452·0	12·15	575·5	10·54
2	Enthetic „ ..	127	..	..	..	154·3	..	203·2	·12
3	Dietic „ ..	27	..	..	..	32·8	..	38·6	·25
4	Parasitic „ ..	14	..	..	..	17·0	..	5·2	..
	Class II.								
1	Diathetic Diseases ..	5	..	..	..	6·1	..	7·4	·12
2	Tubercular „ ..	13	1	..	1	15·8	1·22	17·6	3·10
	Class III.								
	Diseases of the—								
1	[illegible] System..	29	1	..	1	35·2	1·22	46·2	2·48
2	[illegible] „ ..	8	..	..	..	9·7	..	20·7	1·12
3	Respiratory „ ..	62	..	..	..	75·3	..	81·6	1·12
4	Digestive „ ..	50	1	..	1	60·8	1·22	139·0	3·22
5	Urinary „ ..	8	..	1	1	9·7	1·22	5·2	·12
6	Reproductive „ ..	6	..	..	..	7·3	..	17·1	..
7	Locomotive „ ..	1	..	1	1	1·2	1·22	4·0	·12
8	Integumental „ ..	129	..	..	..	156·8	..	166·1	..
	Class IV.								
4	Diseases of Nutrition	5	..	..	..	6·1	..	8·3	·25
	Class V.								
1	Accidents	67	3	..	3	81·4	3·64	136·1	1·61
4	Suicide	..	..	..	..	..	..	..	·37
6	Corporal Punishment	..	..	..	..	..	..	3·2	..
	Diseases not specified	..	..	..	..	..	..	3·3	..
	No appreciable disease	..	..	..	..	..	..	·3	..
	Total	923	15	3	18	1121·5	21·89	1478·6	24·54

The increase compared with 1867, both in the admissions and deaths, has been chiefly in MIASMATIC DISEASES. These, when subdivided, give the following results:— *Ceylon.*

Diseases.	Admitted	Died.	Ratio per 1,000 of Mean Strength.			
			1868.		1859–67.	
			Admitted	Died.	Admitted	Died.
Eruptive Fevers	..	..	..	..	·6	·12
Paroxysmal „	148	4	179·8	4·86	109·0	·87
Continued „	16	1	19·4	1·21	81·9	·99
Dysentery and Diarrhœa ..	137	3	166·5	3·64	212·8	5·83
Spasmodic Cholera	2	1	2·4	1·21	4·5	4·23
Sorethroat and Influenza ..	5	..	6·1	..	15·7	..
Ophthalmia	30	..	36·5	..	84·7	..
Rheumatism	15	..	18·2	..	57·1	·12

Paroxysmal Fevers furnished four times as high a ratio of admissions as in 1867, and were also much above the average. The excess occurred at Trincomalee and Galle; at the former 62 cases occurred in an average force of 71 men, and at the latter 37 cases in 84 men. At Galle three-fourths of the cases were admitted in February and March, under the head of remittent fever in the detachment of the 59th Regiment, and were, in the opinion of the Medical Officer, traceable to an old unused well, in close proximity to the barrack-room from which the cases came, being cleaned out and repaired. As soon as this was done and the well covered the disease ceased. At Trincomalee remittent fevers were very prevalent from August till the end of the year, and were attributed to the marshy neighbourhood of the barracks. This station has long been noted for the prevalence of paroxysmal fevers.

Dysentery and Diarrhœa were considerably more prevalent and fatal than in the preceding year. They occurred chiefly at Trincomalee and Kandy; at the former they were probably due to the same cause as the fever; at the latter they were believed by the Medical Officer in charge to be in a great measure attributable to the imprudence of the men, mostly young soldiers recently arrived from England, who disregarded the precautions necessary to protect themselves against the injurious effects of the climate.

Spasmodic Cholera.—Only two cases occurred, both in the 59th Regiment at Colombo, one of them recovered.

Ophthalmia shows a marked reduction. Of the 30 cases 14 occurred in the detachment at Kandy, where in former years the disease prevailed to a considerable extent.

There has been a considerable reduction in venereal diseases, chiefly in cases of syphilis, and also in dietic diseases, or perhaps it would be more correct to say in cases returned under the head of intemperance (*ebriositas*).

DISEASES OF THE DIGESTIVE SYSTEM have been much less prevalent and fatal than formerly; the reduction has taken place chiefly in the admissions by inflammation of the liver and dyspepsia, and in the deaths by inflammation of the liver.

ACCIDENTS also were very much below the average as regards admissions, but the proportion of deaths was high from the occurrence of three by drowning, the only violent deaths during the year. They all occurred in the 59th Regiment, two of them from men being carried away by the current when bathing, and the third, it was presumed, from accidentally falling from the ramparts into the moat of the fort at Colombo at night.

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2. BLACK TROOPS.

This force consisted, as in former years, of Gun Lascars and the Ceylon Rifle Regiment; the detachment of the latter corps, which was employed at

Ceylon. Hong Kong, rejoined Head-Quarters in the beginning of July, and two companies were sent to Labuan in the middle of October.

The average strength during the year was 1,028; the admissions into hospital were 490, and the deaths 22, being in the ratio of 477 and 21·40 per 1,000 of the strength. The admissions were much lower than in any year since these Reports were commenced, but the deaths were considerably above the average.

The following Table framed from Abstract No. 19 in the Appendix, shows the admissions and deaths by the different classes of diseases:—

Orders.	Black Troops	Strength 1,028.		Annual Ratio per 1,000 of Mean Strength.			
	Diseases.	Admitted	Died.	1868.		1859–69.	
				Admitted	Died.	Admitted	Died.
	Class I.						
1	Miasmatic Diseases ..	257	10	250·0	9·72	645·4	8·43
2	Enthetic „ ..	27	..	26·3	..	25·2	..
3	Dietic „ ..	..	..	..	..	1·2	·08
4	Parasitic „ ..	25	..	24·3	..	53·8	..
	Class II.						
1	Diathetic Diseases ..	2	..	1·9	..	6·3	·56
2	Tubercular „ ..	2	2	1·9	1·95	3·0	1·28
	Class III.						
	Diseases of the—						
1	Nervous System ..	7	2	6·8	1·95	11·5	·80
2	Circulatory „ ..	1	1	1·0	·97	1·4	·72
3	Respiratory „ ..	52	4	50·6	3·89	52·2	·72
4	Digestive „ ..	15	2	14·6	1·95	40·6	·80
5	Urinary „ ..	..	..	..	..	·5	..
6	Reproductive „ ..	14	..	13·6	..	7·5	..
7	Locomotive „ ..	..	..	..	..	1·1	..
8	Integumentary „ ..	63	1	61·3	·97	128·0	..
	Class IV.						
4	Diseases of Nutrition ..	1	..	1·0	..	1·3	·24
	Class V.						
1	Accidents	24	..	23·3	..	77·0	·32
4	Suicide	..	..	..	..	..	·24
6	Corporal Punishment ..	..	..	..	..	·8	..
	Diseases not specified ..	..	..	..	..	·7	·08
	Total	490	22	476·6	21·40	1057·5	14·27

The admissions have not amounted to half the average; the reduction has taken place chiefly in miasmatic diseases, and also in parasitic diseases and those of the integumentary system, and in accidents. The deaths have exceeded the average by one-half, the excess being principally in diseases of the respiratory, digestive and nervous systems, and miasmatic diseases.

MIASMATIC DISEASES.—The admissions and deaths by the principal of these were as follows:—

Diseases.	Admitted.	Died.	Ratio per 1,000 of Mean Strength.			
			1868.		1859–67.	
			Admitted.	Died.	Admitted.	Died.
Eruptive Fevers	5	..	4·9	..	9·2	·20
Paroxysmal „	142	6	138·1	5·84	396·0	1·36
Continued „	..	..	..	..	30·1	·24
Dysentery and Diarrhœa ..	31	3	30·2	2·92	63·3	2·73
Spasmodic Cholera	..	..	..	..	8·0	4·01
Sorethroat and Influenza ..	2	..	1·9	..	2·4	..
Ophthalmia	35	..	34·0	..	66·2	..
Rheumatism	26	..	25·3	..	52·6	..

Paroxysmal Fevers.—The proportion of cases of this group amounted to only one-third, but the deaths to four times the average. There is no information given in the Reports as to the cause of the decrease in their prevalence; but the Medical Officer in charge of the Ceylon Rifles states that "the greatest "mortality occurred amongst the men invalided or recently returned from "Hong Kong, and whose decease cannot be fairly attributed to Ceylon." The stations at which paroxysmal fevers were most prevalent were Trincomalee and Kandy.

The admissions by the other diseases of this class amounted to only half the average, but we are unable to assign any cause for this great reduction. No cases of cholera occurred during the year among the Asiatic troops.

PARASITIC DISEASES were much below the average, from the greater immunity of the men from itch. There has also been a very marked reduction in diseases of the DIGESTIVE SYSTEM, the difference being in cases of colic, which was formerly very prevalent and of which only one case occurred in the year under review, and in diseases of the INTEGUMENTARY SYSTEM, chiefly boils, abscesses, and ulcers.

ACCIDENTS AND VIOLENCE furnished only one-third of the usual proportion of admissions, and there was no death in that class.

SANITARY REPORT.

Deputy Inspector-General Banon reports that, during 1868, there has been a freedom from serious disease and epidemics of all kinds, and that this satisfactory state of health of the troops extended to the Native corps as well as the European. Among the causes favourably affecting the general health of the men may be mentioned:—the absence of overcrowding in barracks, the absence of long and harrassing parades and drills during the hot weather, and the diminution of the night duties as much as possible, so as to allow of five and six consecutive nights in bed. There is no doubt that the loss of rest and exposure to night air and miasmata in a tropical country act with baneful effect on the European soldier.

The healthy state of the troops in Ceylon during the last three years has probably been attributable also to the fact that these years have been remarkably dry ones. Ceylon is supposed to be subject to cycles of dry and wet seasons.

Section II.

On the Extent of Invaliding.

Of the European Force there were 24 men sent to England during the year as invalids, and 11 finally discharged the Service at Netley, being respectively in the ratio of 29·16 and 13·37 per 1,000 of mean strength. During the same period there were 30 or 29·18 per 1,000 of the Asiatic Troops discharged as invalids in Ceylon.

The following Summary, framed from Abstract No. 20 in the Appendix, shows the influence of the different classes of diseases on the invaliding:—

Ceylon.

	White Troops.		Black Troops.
	Invalids sent to England.	Invalids Discharged at Netley.	Discharged as Invalids in Ceylon.
Fever	1	..	1
Dysentery and Diarrhœa	2	..	..
Ophthalmia	..	..	3
Rheumatism	..	..	18
Venereal Diseases	3	1	..
Tubercular „	6	3	..
Diseases of the—			
Nervous System	4	3	2
Circulatory „	1	..	..
Respiratory „	2	..	2
Digestive „	2	1	1
Reproductive „	..	..	1
Locomotive „	1	1	..
Integumentary „	1	1	..
Diseases of Nutrition	..	1	..
Accidents and Violence	1	..	..
Total.. ..	24	11	30
Ratio per 1,000 of Strength { 1868	29·16	13·37	29·18
Ratio per 1,000 of Strength { 1860-67	53·53	23·34	14·77

The invaliding of the European Troops was considerably under, and of the Asiatic above, the average, though differing little from the results for 1867. Rheumatism, as in former years, was the chief cause assigned for the discharge of the Asiatics, but they were all men of long service.

Section III.

Mean Daily Sick.

The average number constantly non-effective from sickness among the European Troops was 40, or 48·60 per 1,000, and among the Asiatics 22, or 21·40 per 1,000 of mean strength. The following Table gives the usual information deduced from these numbers:—

	White Troops.		Black Troops.	
	1868.	1859-67.	1868.	1859-67.
Ratio per 1,000 of Strength constantly sick	48·60	69·66	21·40	34·00
	days.	days.	days.	days.
Average sick time to each Soldier	17·74	25·42	7·81	12·41
Average duration of cases of Sickness ..	15·82	17·20	16·39	11·74

The results in both European and Asiatic Forces have been greatly under the average of the preceding nine years. Compared with those for 1867, there has been a moderate reduction in the proportion constantly sick, the sick time to each soldier, and the duration of the cases among the European Troops;

and a very marked reduction in the first two of those among the Asiatics, but with an increase of there days in the duration of the cases. It would appear, therefore, that the great reduction in the admissions was, to a considerable extent at least, in slight cases requiring at most a few days treatment. *Ceylon.*

Section IV.

Influence of Age on the Mortality.

The following Table shows the ages of the European Troops serving in the Island the whole of the year, and the deaths at each age in quinquennial periods :—

Corps.	Under 20 Years.		20 and under 25.		25 and under 30.		30 and under 35.		35 and under 40.		40 and upwards.	
	Strength on 1st Jan.	Died	Strength on 1st Jan.	Died.	Strength on 1st Jan.	Died.	Strength on 1st Jan.	Died.	Strength on 1st Jan.	Died.	Strength on 1st Jan.	Died.
Royal Artillery	3	...	15	...	25	1	24	1	13	1	2	...
59th Foot	234	2	197	5	143	5	113	...	43	2	2	...
Total	237	2	212	5	168	6	137	1	56	3	4	...
Ratio of deaths per 1,000 { 1868	8·44		23·59		35·66		7·30		53·57		...	
{ 1859-67 ...	8·00		15·63		27·07		37·34		52·86		111·11	

These results show a rapid deterioration of life with the advance of age.

Owing to the changes in the composition of the Asiatic Force during the year, the returns of ages are not available.

X.—ON THE HEALTH OF THE TROOPS IN THE AUSTRALASIAN COLONIES.

Section I.
Sickness and Mortality.

I. Australia and Tasmania.

STATISTICAL REPORT.

Australia. In September, a battery of the 1st Brigade Royal Artillery arrived from Gibraltar to relieve a battery of the 15th Brigade, which proceeded to that station; and in the same month a battery of the 2nd Brigade embarked at Melbourne for Ceylon. Besides these batteries, the troops in the Command consisted of the 2nd Battalion 14th, and the 50th Regiment.

The average strength of the troops during the year was 1,690; the admissions into hospital were 1,139, and the deaths 22, of which 8 occurred out of hospital, and 1 among the invalids sent to England. These numbers give the proportion of 674 admissions, and 13·02 deaths per 1,000 of mean strength, the former being lower and the latter considerably higher than in the preceding year.

The following Table shows the influence of the different classes of diseases in causing the admissions and deaths. The details for 1868 are given in Abstract No. 22 in the Appendix:—

Average Strength .. 1,690

Orders.	Classes of Diseases.	Australia and Tasmania. 1868. Admitted.	Died. In the Colony.	Died. Of Invalids.	Total Deaths.	Ratio per 1,000. Admitted.	Ratio per 1,000. Died.	1859-67. Ratio per 1,000. Admitted.	1859-67. Ratio per 1,000. Died.
	Class I.								
1	Miasmatic Diseases ..	176	1	..	1	104·1	·59	190·5	1·65
2	Enthetic „ ..	403	..	..	..	238·5	..	143·9	..
3	Dietic „ ..	59	..	..	..	34·9	..	30·0	·11
4	Parasitic „ ..	4	..	..	..	2·4	..	4·1	..
	Class II.								
1	Diathetic Diseases ..	2	..	..	..	1·2	..	7·0	·23
2	Tubercular „ ..	28	5	1	6	16·6	3·55	14·9	5·05
	Class III. Diseases of the—								
1	Nervous System ..	30	5	..	5	17·7	2·96	26·0	1·30
2	Circulatory „ ..	6	4	..	4	3·5	2·37	11·3	2·12
3	Respiratory „ ..	74	..	..	..	43·8	..	54·0	·70
4	Digestive „ ..	68	4	..	4	40·2	2·37	44·6	·47
5	Urinary „ ..	4	..	..	..	2·4	..	3·3	·47
6	Reproductive „ ..	10	..	..	..	5·9	..	3·6	..
7	Locomotive „ ..	2	..	..	..	1·2	..	2·4	..
8	Integumentary „ ..	126	..	..	..	74·5	..	65·0	..
	Class V.								
1	Accidents	147	1	..	1	87·0	·59	102·7	1·06
4	Suicide	..	1	..	1	..	·59	..	·23
6	Corporal Punishment	..	..	..	..	..	..	2·7	..
	Diseases not specified	..	..	..	..	..	..	7·8	·11
	No appreciable Disease	..	..	..	..	..	..	·7	..
	Total	1139	21	1	22	673·9	13·02	714·5	13·50

The admissions have been about 40 per 1,000 under the average of the preceding nine years, the decrease being chiefly in miasmatic diseases and accidents; but venereal diseases have been considerably above the average; the mortality was slightly under the average.

Miasmatic Diseases were greatly under the average, both in admissions and deaths, as will be seen by the following Table:—

Diseases.	Admitted.	Died.	Annual Ratio per 1,000 of Strength 1868. Admitted.	1868. Died.	1860-67. Admitted.	1860-67. Died.
Eruptive Fevers	..	..	..	..	1·4	·12
Paroxysmal „	11	..	6·5	..	5·0	·12
Continued „	22	..	13·0	..	19·3	·92
Dysentery and Diarrhœa ..	28	1	16·6	·59	35·2	·36
Sorethroat and Influenza ..	25	..	14·8	..	36·6	·12
Ophthalmia	36	..	21·3	..	43·1	..
Rheumatism	44	..	26·0	..	39·6	..

The admissions have been under the average in all these groups except paroxysmal fevers, in which they have been very slightly above it. Compared

Australia. with the results for 1867 there is a very marked and satisfactory decrease in the amount of ophthalmia.

ENTHETIC DISEASES, though still greatly above the average, were less prevalent than in 1867; the reduction was confined to cases of gonorrhœa.

DIETIC DISEASES gave rise to fewer admissions than in 1867, but were still a source of considerable inefficiency. The cases were all returned under the head of intemperance (*ebriositas*).

The other classes of diseases do not seem to require special comment.

SANITARY REPORT.

Deputy Inspector-General Ewing reports:—

"The health of the troops in this command has been very good. Venereal diseases during the year have affected the amount of sickness to a very great extent, having been the cause of more than one-third of the admissions to hospitals. The admissions caused by intemperance, directly and indirectly, have likewise been very numerous. My arrival in Australia has been so recent that my personal knowledge of the different stations is as yet very limited, indeed confined to the colony of Victoria.

The barrack and hospital accommodation is favourably mentioned in the reports from all the stations, and their sanitary condition also. At the Melbourne barracks, after repeated representations, the swamp is being drained, and the ventilation of the guard-room has been improved.

The improvements recommended in the hospital at Adelaide have been effected, and the deficiencies made good.

The barracks in this command belong to the different colonies, and great difficulty and delay arise in making necessary repairs; the state of the Victoria Barracks, Melbourne, is an instance. The ceilings have been out of repair for more than a year, and though frequent and urgent representations have been made to the Colonial Government and the War Office authorities, nothing has been done. The hospital in these barracks is not well suited to its purpose, there is no space for convalescents to enjoy air and exercise, and it stands too close to the soldiers' rooms.

My predecessor in his last year's report remarked upon the barrack accommodation generally in the command as too limited. The withdrawal of a regiment now under orders for home will have the desired effect.

The healthy climate of Melbourne, and the immunity it has hitherto enjoyed from serious epidemics, appear unfortunately to have led the municipality to overlook the importance of good drainage; this neglect, if not remedied, may, in the event of any serious visitation of that nature, be followed by the gravest consequences to the inhabitants and the troops."

II. NEW ZEALAND.

STATISTICAL REPORT.

New Zealand. The force employed in New Zealand during the year consisted of a small detachment of Artillery and of the 2nd Battalion 18th Regiment. The average strength during the year was 841; the admissions into hospital amounted to 630, and the deaths to 7, being in the ratio of 749 and 8·32 per 1,000 of the strength, both considerably higher than in the preceding year.

The influence of the different classes of diseases in causing the sickness and mortality is shown in the following Table, framed from Abstract No. 22 in the Appendix.

Orders.	Diseases.	Average Strength ..	Admissions.	Deaths. In New Zealand.	Deaths. Of Invalids.	Deaths. Total.	Ratio per 1,000 of Mean Strength. 1868. Admitted.	1868. Died.	*1859-67. Admitted.	*1859-67. Died.
		841.								
	Class I.									
1	Miasmatic Diseases	..	164	..	..	..	195·0	..	204·1	2·05
2	Enthetic „	..	55	..	..	..	65·4	..	26·4	·04
3	Dietic „	..	37	..	..	..	44·0	..	11·9	·33
4	Parasitic „	..	2	..	..	..	2·4	..	15·4	..
	Class II.									
1	Diathetic Diseases	..	8	..	..	..	9·5	..	5·3	·11
2	Tubercular „	..	5	3	..	3	5·9	3·57	8·7	1·72
	Class III. Diseases of the—									
1	Nervous System	..	46	..	..	..	54·7	..	19·5	·82
2	Circulatory „	..	8	3	..	3	9·5	3·57	8·1	1·66
3	Respiratory „	..	79	1	..	1	53·9	1·18	50·7	·80
4	Digestive „	..	40	..	..	..	47·6	..	32·8	·75
5	Urinary „	..	7	..	..	..	8·3	..	2·3	·24
6	Reproductive „	..	4	..	..	..	4·8	..	5·5	..
7	Locomotive „	..	9	..	..	..	10·7	..	3·6	..
8	Integumentary „	..	54	..	..	..	64·2	..	71·0	·11
	Class IV.									
4	Diseases of Nutrition	..	1	..	..	..	1·2	..	·7	..
	Class V.									
1	Accidents	.. ..	109	..	..	..	129·6	..	88·7	2·39
2	In Battle..	.. ..	..	..	..	..	..	..	12·7	5·05
3	Homicide	.. ..	..	..	..	..	..	..	·1	·06
4	Suicide ..	.. ..	..	..	..	..	..	..	·1	·04
5	Execution	.. ..	..	..	..	..	..	..	..	·02
6	Corporal Punishment	..	2	..	..	..	2·4	..	15·8	..
	Diseases not specified	..	..	..	..	..	..	..	1·6	·04
	Total	.. ..	630	7	..	7	749·1	8·32	585·0	16·23

The admissions were considerably above but the deaths little more than half the average of the preceding nine years; during great part of that period, however, the service on which the force was employed was so exceptional as to prevent the results being brought fairly into comparison.

MIASMATIC DISEASES did not differ materially from the average. When subdivided they give the following results :—

New Zealand.

Diseases.	Admitted.	Died.	Annual Ratio per 1,000 of Strength. 1868. Admitted.	1868. Died.	1859-67. Admitted.	1859-67. Died.
Eruptive Fevers	..	..	..	..	·1	·02
Paroxysmal ,, ...	..	..	..	..	4·0	·04
Continued ,, ...	9	..	10·7	..	32·0	1·04
Dysentery and Diarrhœa ..	28	..	33·3	..	54·3	·84
Sorethroat and Influenza ..	32	..	38·1	..	25·2	..
Ophthalmia	54	..	64·2	..	47·2	..
Rheumatism	24	..	28·5	..	30·8	..

The admissions were under the average by all the diseases except sorethroat and influenza, and ophthalmia. The increase in the amount of the latter is noticed by the Medical Officer in charge of the 18th Regiment, but no special cause is assigned for it; the proportion was rather more than double that of 1867.

Enthetic Diseases were more prevalent than in 1867, and greatly above the average, but the difference has been caused by the troops being quartered in towns in 1868, while during previous periods a large portion at least of the force was in the field. The increase has been chiefly in cases of Gonorrhœa.

Dietic Diseases also show a large increase, due no doubt to the different position in which the troops were placed with reference to facilities for obtaining the means of intemperance.

Diseases of the Nervous System show a very marked increase in the admissions. This has been due to the occurrence of 16 cases recorded as headache, and 11 as *otitis*. No details of these cases are given, nor has the Medical Officer made any remark on the cause of so large a number having been admitted.

Accidents and Violence.—The admissions by this class have been very high, chiefly under the head of contusions and sprains. The increase may probably be connected with that already noticed under dietic diseases. No deaths by this class were recorded.

SANITARY REPORT.

The Principal Medical Officer reports that the health of the troops serving in New Zealand during the year 1868 was very good. No deaths occurred from zymotic or preventable diseases.

There were no material alterations or improvements effected at any of the stations during the year; and those which are required in respect to increased facilities for ablution, extended means for varying the cooking at some detachments, &c., have not been entertained in consequence of the troops being about to be removed from the colony.

Section II.

On the Extent of Invaliding.

Australasia.

There were 37 invalids sent to England from Australia and New Zealand during the year, being in the ratio of 14·62 per 1,000 of the strength. During the same period 4 invalids were discharged in the colony, and 15 at Netley, making a total of 19, or 7·51 per 1,000.

The following Table, framed from Abstract No. 23 in the Appendix, shows the classes of disabilities which occasioned the invaliding :—

Australasia.

Mean Annual Strength, 2,531. Classes of Disabilities.	Invalids sent to England from Australasia.	Invalids Discharged the Service. In Australasia.	Invalids Discharged the Service. In England.
Ophthalmia	6	..	4
Paroxysmal Fevers	1	..	..
Rheumatism	3	..	..
Tubercular Diseases	10	1	5
Diseases of the—			
Nervous System	7	1	..
Circulatory „	6	1	2
Respiratory „	3	1	..
Digestive „	..	..	1
Locomotive „	1	..	..
Diseases of Nutrition	..	..	1
Accidents and Violence	..	..	2
Total	37	4	15
Ratio per 1,000 of Mean Strength 1868..	14·62	1·58	5·93
Ratio per 1,000 of Mean Strength 1861–7	21·11	3·50	14·37

The proportion of invalids sent home corresponded very closely with the results of 1867, and that of invalids discharged the service was lower than in that year; both were considerably below the average. Tubercular diseases were the most prevalent cause of disability.

Section III.

Mean Daily Sick.

The mean daily sick in Australia during the year amounted to 55, and in New Zealand to 31, being respectively in the ratio 32·54 and 36·86 per 1,000 of mean strength. From these numbers the following results have been obtained:—

	Australia and Tasmania.		New Zealand.	
	1868.	1859–67.	1868.	1860–7.
Ratio per 1,000 constantly sick	32·54	33·71	36·86	34·18
	days.	days.	days.	days.
Average sick time to each soldier	11·88	12·30	13·45	12·47
Average duration of cases	17·63	17·28	17·96	21·44

The results do not differ materially from the average. Compared with 1867 there has been a decrease in the mean sick in Australia, and an increase in New Zealand, but there has been a decrease in the duration of the cases at the latter station.

Section IV.

On the Influence of Age on the Mortality.

Australasia. The ratio of Mortality at different ages among the troops serving in Australasia is shown in the following Table. The details for 1868 are given in Abstract No. 24 in the Appendix :—

		Under 20 Years.	20 and under 25.	25 and under 30.	30 and under 35.	35 and under 40.	40 and Upwards.
Ratio of deaths per 1,000 living ..	1868 ..	..	2·58	9·75	10·75	15·56	..
	1859–67	6·33	12·22	15·95	16·10	25·27	44·41

XI.—ON THE HEALTH OF THE TROOPS SERVING IN CHINA AND JAPAN.

Section I.

Sickness and Mortality.

STATISTICAL REPORT.

I. China.

China.

The European troops in China during the year consisted of half a battery of Royal Artillery and the 73rd Regiment, and from the 22nd December till the end of the year of the 75th Regiment, which arrived from Gibraltar to relieve the 73rd; the latter corps embarked for Ceylon and Singapore on the last day of the year.

The Asiatic troops consisted of a detachment of Gun Lascars attached to the Royal Artillery, and four companies of the Ceylon Rifles, till the 5th of June, when they embarked for Ceylon on being relieved by the 29th Madras Native Infantry.

1. White Troops.

The average strength of the European troops during the year was 668; the admissions into hospital among them were 727, and the deaths 10, of which one occurred out of hospital and 3 among invalids sent to England. These numbers give the proportions of 1,088 and 14·97 per 1,000 of the strength, both lower than in the preceding year.

China.

The diseases by which the sickness and mortality were caused are stated in Abstract No. 22 in the Appendix, from which the following classified summary has been framed :—

Order.	Diseases.	Strength .. .. 668. Admitted.	Died. In China.	Died. Of Invalids.	Died. Total.	Annual Ratio per 1,000. 1868. Admitted.	1868. Died.	1859-67. Admitted.	1859-67. Died.
	Class I.								
1	Miasmatic Diseases ..	283	1	..	1	423·6	1·50	1206·1	39·60
2	Enthetic „ ..	122	..	..	..	182·6	..	321·6	·04
3	Dietic „ ..	26	..	..	..	38·9	..	37·5	·37
4	Parasitic „ ..	1	..	..	..	1·5	..	8·1	..
	Class II.								
1	Diathetic Diseases ..	5	..	..	..	7·5	..	5·9	·42
2	Tubercular „ ..	15	1	2	3	22·5	4·48	10·8	2·17
	Class III. Diseases of the—								
1	Nervous System ..	31	2	..	2	50·9	2·99	34·4	2·63
2	Circulatory „ ..	7	1	..	1	10·5	1·50	9·7	1·20
3	Respiratory „ ..	12	1	..	1	18·0	1·50	89·9	1·76
4	Digestive „ ..	54	..	..	..	80·8	..	100·3	2·91
5	Urinary „ ..	2	..	..	..	3·0	..	2·2	·09
6	Reproductive „ ..	21	..	..	..	31·4	..	8·4	..
7	Locomotive „ ..	2	..	1	1	3·0	1·50	4·4	..
8	Integumentary „ ..	60	..	..	..	89·8	..	117·0	·13
	Class IV.								
4	Diseases of Nutrition ..	1	..	..	..	1·5	..	20·0	·50
	Class V.								
1	Accidents	82	1	..	1	122·8	1·50	90·7	3·28
2	Battle	..	..	..	..	..	..	·5	·13
3	Homicide	..	..	..	..	..	..	..	·23
4	Suicide	..	..	..	..	..	..	..	·46
6	Corporal Punishment ..	..	..	..	..	..	..	3·9	..
	Diseases not specified ..	..	..	..	..	..	..	14·2	·18
	Total	727	7	3	10	1088·3	14·97	2085·6	56·10

The admissions have been nearly one-fourth under the proportion in 1867, and have amounted to only half the average of the last nine years. The reduction has been chiefly in miasmatic, but has also been well marked in enthetic diseases. The mortality has been only a fourth of the average, the decrease being almost entirely in miasmatic diseases. This marked improvement in the health of the troops is attributed by the Principal Medical Officer to improved diet, less severe duty, more space in barracks, the use of punkahs when necessary, and attention to suit the clothing to the weather and the season.

Miasmatic Diseases when subdivided give the following results :—

Diseases.	Admitted.	Died.	Annual Ratio per 1,000 of Strength. 1868. Admitted.	1868. Died.	1859–67. Admitted.	1859–67. Died.
Eruptive Fevers	1	..	1·5	..	2·6	·38
Paroxysmal „	162	1	242·5	1·50	571·6	7·57
Continued „	7	..	10·5	..	236·4	4·24
Dysentery and Diarrhœa	83	..	124·2	..	256·1	16·50
Spasmodic Cholera	..	..	..	..	13·7	8·06
Sorethroat and Influenza	8	..	12·0	..	15·3	..
Ophthalmia	3	..	4·5	..	74·9	..
Rheumatism	15	..	22·4	..	55·4	·10

The great reduction both in admissions and deaths by this class of diseases has taken place in paroxysmal and continued fevers, and dysentery and diarrhœa. There has also been a very marked decrease in cases of ophthalmia, and an exemption from spasmodic cholera. The prevalence and mortality of these diseases has been considerably less than in any of the preceding nine years.

ENTHETIC DISEASES although considerably under the average were more prevalent that in 1867. The increase was chiefly in cases of gonorrhœa.

DISEASES OF THE NERVOUS SYSTEM furnished a higher ratio of admissions than in 1867; the excess was in cases of *delirium tremens*, of which 15 were admitted and 2 died; 13 of these, including one of the fatal cases, were reported by the 73rd Regiment, the other death occurred in the Royal Artillery.

ACCIDENTAL AND VIOLENT DEATHS.—One death only is recorded in this class, that of a drummer in the 75th Regiment, who was accidentally drowned at Hong Kong a few days after his arrival.

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2. NATIVE OR ASIATIC TROOPS.

The average strength of the Asiatic troops during the year was 691; the admissions into hospital were 682, and the deaths 17, being in the ratio of 987 and 24·60 per 1,000 respectively—both much under the proportion in the preceding year.

The admissions and deaths by the different classes of diseases are shown in the following Table, framed from Abstract No. 22 in the Appendix:—

China.

Orders.	Diseases.	Average Strength ... 691. Admissions.	Deaths.	Ratio per 1,000 of Mean Strength. 1868. Admitted.	1868. Died.	1861-67. Admitted.	1861-67. Died.
	Class I.						
1	Miasmatic Diseases ..	402	5	581·8	7·23	860·0	14·95
2	Enthetic „ ..	34	..	49·2	..	93·0	·55
3	Dietic „ ..	3	..	4·3	..	1·4	..
4	Parasitic „ ..	22	..	31·8	..	15·6	..
	Class II.						
1	Diathetic Diseases ..	15	2	21·7	2·89	13·7	1·55
2	Tubercular „ ..	4	1	5·8	1·45	3·3	1·33
	Class III. Diseases of the—						
1	Nervous System	10	..	14·5	..	16·8	·11
2	Circulatory „	3	1	4·3	1·45	·7	·66
3	Respiratory „	71	4	102·8	5·78	80·5	2·77
4	Digestive „	11	..	15·9	..	46·6	·78
5	Urinary „	4	..	5·8	..	2·1	..
6	Reproductive „	9	..	13·0	..	3·1	·11
7	Locomotive „	1	..	1·4	..	1·9	·11
8	Integumentary „	48	1	69·5	1·45	61·8	..
	Class IV.						
4	Diseases of Nutrition.	18	1	26·1	1·45	20·2	3·10
	Class V.						
1	Accidents	25	1	36·2	1·45	56·3	·55
2	Battle	..	..	..	..	1·4	·11
3	Homicide	..	..	..	..	..	·11
4	Suicide	1	1	1·4	1·45	..	·22
5	Execution	..	..	..	..	..	·11
6	Corporal Punishment.	..	..	..	..	·8	
	No appreciable disease	1	..	1·4	..	·5	..
	Total ..	682	17	986·9	24·60	1279·7	27·12

The admissions and deaths were considerably under the average of the preceding seven years; the decrease being principally in miasmatic diseases.

MIASMATIC DISEASES when subdivided give the following results:—

Diseases.	Admitted.	Died.	Annual Ratio per 1,000. 1868. Admitted.	1868. Died.	1861-7. Admitted.	1861-7. Died.
Eruptive Fevers	20	..	29·0	..	10·8	·52
Paroxysmal „	170	2	246·0	2·89	584·3	2·57
Continued „	12	2	17·4	2·89	47·2	1·80
Dysentery and Diarrhœa ..	113	..	163·5	..	186·7	7·98
Spasmodic Cholera	..	..	..	..	13·9	3·99
Sorethroat and Influenza ..	2	..	2·9	..	7·5	..
Ophthalmia	3	..	4·3	..	13·1	..
Rheumatism	61	..	88·3	..	124·1	·26

Eruptive Fevers gave rise to nearly thrice the average proportion of admissions, from the occurrence of 14 cases of small-pox and 6 cases of chicken-pox in the detachment of Ceylon Rifles. The cases of small-pox are all reported to have been mild, and the men to have borne satisfactory marks of vaccination. *China.*

All the other groups of diseases in the miasmatic class were under the average, and, except rheumatism, less prevalent also than in 1867, but the decrease was most marked in paroxysmal fevers. Like the European force, the Asiatic troops entirely escaped spasmodic cholera.

DIATHETIC DISEASES.—The admissions by this class, though above the average of the last nine years, amounted to only one-third of the proportion in 1867, and the deaths to one eighth. Of the 15 cases returned in this class nine were of general dropsy, all of which occurred in the detachment of the Ceylon Rifles. One of these cases terminated fatally; the other death was from *anœmia* in the Madras Corps.

ENTHETIC DISEASES were greatly under the average, the admissions amounting only to 5 per cent. of the mean strength. The low ratio of these cases is attributed by the Medical Officers to the manner in which the Prevention of Contagious Diseases Ordinance, passed in 1867, has been carried into operation. A reference, however, to the prevalence of these diseases among European troops shows that no such benefit was derived by them, and even among the Asiatic troops the Gun Lascars had 15 cases in an average strength of 71 men, or in the proportion of 211 per 1,000. It seems not improbable that the low ratio in the Ceylon Rifles and 29th Madras Native Infantry may have been in a great measure due to some regimental arrangement.

ACCIDENTAL AND VIOLENT DEATHS were two in number. A private of the 29th Madras Native Infantry was killed by the falling of a wall at Hong Kong, and a Gun Lascar committed suicide by shooting himself while on sentry.

SANITARY REPORT.

Deputy Inspector-General Heffernan writes:—

The year having been an unusually healthy one in China, there were comparatively few complaints from the Medical Officers in charge of corps. From my own observation, however, I can point to the following defects that require to be rectified:—

The imperfect manner of lighting the barracks and hospitals at night, noticed by me in last year's sanitary report, I regret to say, still continues, viz., by oil lamps that are both inefficient and unwholesome. Gas has been objected to by the home authorities, owing to the expense, but it is unquestionably the best method of lighting a large building like a barrack or hospital. New cook-houses and latrines, urinals, and ablution rooms for the north barracks occupied by the Royal Artillery are much required, the present buildings being old, in bad repair, and of a very objectionable construction. There is a great want of proper quarters for married soldiers. Some are in progress of erection at the new barracks, and the subject generally is under the consideration of the authorities. Urinals are required for the European garrison hospital; there are very good waterclosets, but no urinals attached to them.

The chief sanitary improvements during the year have been:—

The completion of three blocks of the new barracks, with the erection of cook-houses, latrines, and ablution room, which enabled them to be occupied by European soldiers transferred from Fletcher's buildings.

The roof over the left wing of the European garrison hospital was entirely renewed, having been completely eaten away by white ants. The wooden floors of the same hospital were laid fresh in many places. A verandah on brick arches was added to the quarters at Spring Gardens occupied by the staff serjeants. The roof of the soldiers' gymnasium was renewed, so that it now affords a place for exercise quite screened from sun and rain. A paved surface drain was laid down on the road leading to head-quarter house.

The European troops have been more healthy than in any year since Hong Kong has been occupied. This I attribute to the fact of the men having had ample space in the barracks, the use of punkahs at night in the hot weather, good diet, and light night-duty.

The above are the necessities for health which have been established

China. by the misfortunes of 1865, and the gradual improvement in the health of the men since; but the general result has been greatly assisted by vigilant attention to small details, such as care to vary their clothing according to the changes of the weather and season, the avoidance of any exposure to the sun, attention to ventilation, and encouraging the men to employ and amuse themselves.

Whatever general rules may be laid down, it is only by strict attention to every day varying circumstances that the European soldier can be kept in health in a tropical climate.

II. JAPAN.

Japan. In the beginning of April the 1st Battalion 10th, from the Cape of Good Hope, relieved the 2nd Battalion 9th Regiment, which embarked for England. The garrison comprised in addition to these, a detachment of Royal Artillery and Engineers, and a few men of the Army Hospital and Commissariat Staff Corps.

The average strength of the troops during the year was 785; the admissions were 993, and the deaths 11, being in the ratio of 1,265 and 14·01 per 1,000 of the strength; the former considerably lower and the latter higher than in the preceding year.

The following Table, framed from Abstract No. 22 in the Appendix, shows the admissions and deaths by classes of diseases:—

Orders.	Diseases.	Average Annual Strength, 785.		Ratio per 1,000.			
				1868.		1864-7.	
		Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
	Class I.						
1	Miasmatic Diseases	249	..	317·2	..	569·7	11·10
2	Enthetic „	435	..	554·1	..	526·3	..
3	Dietic „	34	..	43·3	..	24·1	·32
4	Parasitic „	6	..	7·6	..	12·7	..
	Class II.						
1	Diathetic Diseases	9	..	11·5	..	3·3	..
2	Tubercular Diseases.. ..	8	2	10·2	2·55	8·2	·65
	Class III.						
	Diseases of the—						
1	Nervous System	9	1	11·5	1·27	16·6	·98
2	Circulatory „	5	2	6·4	2·55	2·6	1·30
3	Respiratory „	45	4	57·3	5·10	44·6	2·61
4	Digestive „	30	1	38·2	1·27	32·3	·98
5	Urinary „	2	1	2·6	1·27	3·9	·65
6	Reproductive „	11	..	14·0	..	14·0	..
7	Locomotive „	..	..	..	..	6·2	..
8	Integumentary „	70	..	89·2	..	137·9	..
	Class IV.						
4	Diseases of Nutrition ..	1	..	1·3	..	12·7	..
	Class V.						
1	Accidents	79	..	100·6	..	142·8	2·94
3	Homicide	..	..	..	..	..	·32
4	Suicide	..	..	..	..	..	·64
5	Corporal Punishment ..	..	..	..	..	3·9	..
6	No appreciable disease ..	..	..	..	..	1·9	..
	Total	993	11	1265·0	14·01	1563·1	22·49

The admissions have been one-fifth and the deaths one-third under the average of the preceding four years, the decrease in the former being principally in miasmatic diseases, and those of the integumentary system, and in accidents; and in the latter in miasmatic diseases and accidents. *Japan.*

Compared with the results for 1867 there has been a decrease in the admissions, chiefly in venereal diseases, but an increase in the deaths by tubercular diseases.

MIASMATIC DISEASES.—The admissions and deaths by the principal diseases of this class were as follows:—

Diseases.	Admitted.	Died.	Ratio per 1,000 of Strength.			
			1868.		1864–67.	
			Admitted.	Died.	Admitted.	Died.
Eruptive Fevers ..	1	..	1·3	..	23·2	1·30
Paroxysmal „ ..	3	..	3·8	..	174·8	..
Continued „ ..	8	..	10·2	..	103·7	2·61
Dysentery and Diarrhœa	12	..	15·3	..	61·0	3·26
Spasmodic Cholera ..	..	..	..	..	4·2	3·58
Sorethroat and Influenza	18	..	22·9	..	32·9	·32
Ophthalmia	164	..	208·9	..	66·8	..
Rheumatism	39	..	49·7	..	88·0	..

Not only has there been a great reduction in the amount of miasmatic diseases generally, but also a marked change in their relative prevalence. Thus, fevers of all kinds have nearly disappeared from the Returns, and the admissions by dysentery and diarrhœa have amounted to only one-third of the previous average. There has also been a reduction in the cases of sorethroat and influenza, and of rheumatism, but a great increase in ophthalmia. This change in the distribution of the diseases is probably due to the change of regiments in the early part of the year. During the preceding period the garrison had always consisted of regiments which had been sent from Hong Kong for change of climate, on account of the great prevalence in them of malarious diseases, and the men might be said to be saturated with malaria. In 1868 on the contrary, the line regiment was one which arrived in the beginning of April from the Cape of Good Hope without any predisposition to malarious diseases acquired during their previous service, but bringing with them ophthalmia, from which they had suffered in 1867 to a considerable extent. In the nine months it served at Yokohama this corps had 147 admissions by this disease, being in the annual ratio of 288 per 1,000 of mean strength, while the rest of the garrison furnished only 17 cases, or 62 per 1,000.

The special circumstances under which the troops have hitherto been sent to Japan have been such as to prevent any correct deductions being drawn as to the influence of its climate on the health of soldiers. The statistics hitherto collected show, however, that the climate acts most beneficially in restoring the health of men who have broken down under the influence of the malarious conditions at Hong Kong. Ophthalmia was most prevalent in the 10th Regiment from April till October, when it declined. The Medical Officer attributed its great development to "the extraordinary continuance of heavy rains and "close steaming weather, added to the imperfect state of the wooden huts "and the close crowding of them together, which hindered their drying and "prevented fresh or pure air from ever circulating freely through them."

ENTHETIC DISEASES were nearly one-third under the proportion in 1867 though still a little above the average, the admissions amounting to more than half the strength. The reduction is attributed by the Medical Officer in charge to the intervention of the native authorities at the suggestion of our Minister. The reduction has taken place almost entirely in the syphilitic group of these diseases.

DISEASES OF THE RESPIRATORY SYSTEM were considerably above the average, both in frequency and mortality. The excess was chiefly in the 2nd Battalion 9th Regiment, and caused by bronchitis and inflammation of

Japan. the lungs. Of the latter disease 8 cases, of which 3 died, occurred in it in the month of February, during the prevalence of very cold weather.

Section II.

On the Extent of Invaliding.

China and Japan. During the year, 29 invalids were sent to England, and 4 discharged the service at Netley from these stations, being respectively in the ratio of 19·96 and 2·75 per 1,000 of mean strength of European troops. There was no invaliding of Asiatic troops, the Ceylon Rifles taking with them, on being relieved, those men who would otherwise have been sent to Ceylon as invalids.

The diseases for which the invalids were sent home and discharged, will be found in Abstract No. 23 in the Appendix, from which the following classified summary has been framed :—

	White Troops	
Mean Strength..	1,453	
	Sent as Invalids to England.	Discharged as Invalids in England.
Paroxysmal Fevers	2	..
Dysentery and Diarrhœa	2	..
Rheumatism	1	..
Venereal Diseases	..	1
Diathetic „	1	..
Tubercular „	7	..
Diseases of the—		
Nervous System	3	1
Circulatory „	3	..
Digestive „	5	..
Urinary „	1	..
Locomotive „	1	..
Integumentary „	1	..
Diseases of Nutrition	..	2
Accidents and Violence	2	..
Total	29	4
Ratio per 1,000 of Strength .. { 1868	19·96	2·75
Ratio per 1,000 of Strength .. { 1861–7	57·60	23·89

The numbers of invalids sent to England, and of those discharged at Netley, were much smaller than in the preceding year, and also greatly below the average. Tubercular diseases gave rise to one-fourth of the invaliding. The relief of the regiment in Japan and its return to England may to some extent account for the decrease in the invaliding.

Section III.

Mean Daily Sick.

The average constantly sick of the European troops amounted to 32 in China and 77 in Japan, and of the Asiatic troops to 28 in China. These numbers give as the proportion constantly non-effective of the European force

47·90 in China and 98·09 in Japan, and of the Asiatic force 40·53 per 1,000 of mean strength. *China and Japan.*

From these numbers the following results have been calculated :—

		European Force.		Asiatic Force.
		China.	Japan.	China.
Ratio per 1,000 of Strength constantly Sick	1868..	47·90	98·09	40·53
	1861–7	60·39	82·71	50·83
		days.	days.	days.
Average Sick Time to each Soldier ..	1868..	22·01	35·80	14·79
	1861–7	29·34	30·19	18·55
Average duration of Cases	1868..	20·23	28·31	14·99
	1861–7	15·16	19·69	14·50

There has been a marked reduction in the average constantly non-effective from sickness both of the European and Asiatic troops in China, even compared with the preceding year, and in the average sick time to each soldier, but an increase in the average duration of the cases. In Japan, although the mean sick and average sick time to each soldier have been a trifle lower than in 1867, they have been considerably above the average, and there has been an increase in the duration of the cases. The latter result has been due to the large number of cases of ophthalmia, many of which are very tedious in their progress. The average duration of the cases of ophthalmia, as calculated from the Quarterly Returns, was 53¼ days.

Section IV.

Influence of Age on the Mortality.

The numbers living and the deaths at each age, in quinquennial periods, in those corps which served in the Command during the whole year are shown in the following Table :—

	European Troops.											
	Under 20.		20 and under 25.		25 and under 30.		30 and under 35.		35 and under 40.		40 and upwards.	
	Strength.	Died.	Strength.	Died.	Strength.	Died.	Strength.	Died.	Strength.	Died.	Strength.	Died.
Royal Artillery	..	..	16	1	36	..	28	1	4	..	..	..
73rd Regiment	73	..	181	2	224	2	82	2	8	..	1	..
Total	73	..	197	3	260	2	110	3	12	..	1	..
Ratio of Deaths per 1,000 .. 1868..	..		15·23		7·69		27·27		..		..	
1861-7	7·09		38·34		52·90		58·96		143·69		180·00	

The numbers for 1868 are two small to justify any deductions being drawn from them, but the average of the preceding seven years shows an enormous increase of mortality with the advance of age.

XII.—STRAITS SETTLEMENTS.

Straits Settlements.

Prior to 1868 the garrisons of Singapore and Penang were furnished by the Madras Presidency, and they were included in the Report on the health of the troops in that Command. In January of that year they were separated from Madras, and in the first instance attached to Ceylon, but have since been formed into a separate Command under the designation of the Straits Settlements.

In the middle of January the 3rd, and in the end of February the 9th Battery 2nd Brigade Royal Artillery, arrived in the Command from England and the Cape of Good Hope respectively, and, with a few men of the Army Hospital Corps, formed the European garrison during the remainder of the year.

The average *annual* strength was 183 non-commissioned officers and men; the admissions into hospital among them were 287, and the deaths 4, being respectively in the ratio of 1,568 and 21·84 per 1,000 of mean strength. Compared with the average of the preceding four years the admissions have been slightly in excess, and the deaths very considerably above it. The excess in the deaths, however, arose from two having occurred from an accident.

The diseases by which the sickness and mortality were caused are stated in Abstract No. 19, in the Appendix. The following Table shows the results by classes of diseases:—

Orders.	Diseases.	1868. Mean Strength, 183. Admissions.	1868. Mean Strength, 183. Deaths.	1868. Annual Ratio per 1,000 of Strength. Admissions.	1868. Annual Ratio per 1,000 of Strength. Deaths.	1864–67. Annual Ratio per 1,000 of Strength. Admissions.	1864–67. Annual Ratio per 1,000 of Strength. Deaths.
	Class I.						
1	Miasmatic Diseases. ..	43	..	235·0	..	441·3	2·67
2	Enthetic „ ..	69	..	377·0	..	161·3	..
3	Dietic „ ..	11	1	60·1	5·46	58·7	..
4	Parasitic „ ..	1	..	5·5	..	1·3	..
	Class II.						
1	Diathetic Diseases ..	3	..	16·4	..	..	..
2	Tubercular „ ..	..	..	..	..	21·3	4·00
	Class III. Diseases of the—						
1	Nervous System ..	14	..	76·5	..	58·7	2·67
2	Circulatory „ ..	18	1	98·4	5·46	6·7	2·67
3	Respiratory „ ..	18	..	98·4	..	65·3	..
4	Digestive „ ..	21	..	114·7	..	148·0	..
5	Urinary „ ..	..	..	..	..	6·7	1·33
6	Reproductive „ ..	1	..	5·5	..	42·7	..
7	Locomotive „ ..	2	..	10·9	..	1·3	..
8	Integumentary „ ..	56	..	306 0	..	293·3	..
	Class IV.						
4	Diseases of Nutrition..	2	..	10·9	..	28·0	1·33
	Class V.						
1	Accidents	28	2	153·0	10·92	209·3	..
4	Suicide..	..	..	..	..	..	..
6	Corporal Punishment..	..	..	..	..	10·7	..
	Diseases not specified .	..	..	..	..	..	..
	No appreciable disease.	..	..	..	..	..	..
	Total	287	4	1568·3	21·84	1554·6	14·67

Compared with the four preceding years there has been a very great decrease in miasmatic diseases and those of the reproductive system, and a considerable decrease in diseases of the digestive system and in accidents, but there has been a very marked increase in those of the circulatory system. The numbers under observation have been too small to justify any great importance being attached to the variations in the amount of the less prevalent classes. The decrease in miasmatic diseases was probably due to the garrison being composed of troops from England and the Cape, while during the previous period they were from Madras, where they were likely to have acquired a predisposition to malarious fevers and dysentery. Of miasmatic diseases, diarrhœa and intermittent fever were the most prevalent; of the enthetic, syphilis and gonorrhœa. The high ratio in the diseases of the circulatory system was due to ten cases reported under the head of irritable disease of the heart "the "symptoms being an excited action of the heart accompanied by severe "dyspnœa and pain in the cardiac region, sometimes followed by syncope; an "attack of palpitation was frequently brought on by any ordinary exertion." The Medical Officer in charge offers no explanation of the cause of these affections, but it seems not improbable that they may have had some connection with the

Straits Settlements.

large number of cases returned under the head of intemperance (*ebriositas*). The very high ratio of diseases of the integumentary system was caused by cases of boils and ulcers.

Under the head of accidents the deaths of two men are recorded who were blown away from the mouth of a gun while loading for a salute; but for this lamentable accident the mortality of the troops would have amounted only to 10·92 per 1,000 of the strength.

Invaliding.—Seven men were sent to England as invalids during the year, five of them for heart affection, one for chronic laryngitis, and one for chronic hepatitis.

Mean Sick.—The average number constantly non-effective from sickness amounted to 10·8 or 59·0 per 1,000 of mean strength. The average sick time to each soldier serving was 21·54 days, and the average duration of the cases 13·74 days

SANITARY REPORT.

The Principal Medical Officer reports:—

"From the proximity of the island of Singapore to the equator, the alternations of temperature are exceedingly limited, the lowest monthly averages being about 78° F., and the highest seldom exceeding 85° F. Situated within the belt of perpetual rain, the number of wet days is very large, averaging about 100. The seasons here may be said to be caused by the prevailing monsoons, one commencing in November, and lasting till March, the other from that time till October; the former (from the north-east) is cooler, and more rain falls during its continuance; the latter (from the south-west) is often distressingly oppressive, and is considered more unhealthy. From the unvarying high temperature, and dampness of the climate, convalescence is often very prolonged. The returns, however, do not show a large amount of sickness or mortality. Tropical diseases among the Natives are rare, and almost unknown among the Europeans. An epidemic of cholera or small pox occasionally appears among the natives, but never causing the frightful ravages it does elsewhere. A variety of lepra is also commonly met with among them, causing great disfigurement: dysentery and fevers are very uncommon among Europeans, but the Native Regiment suffers considerably from these diseases. Venereal affections, heart diseases, rheumatism, and bronchitis are the principal diseases among the white troops. The 3rd Battery 2nd Brigade Royal Artillery, arrived here on the 21st January, 1868, and the Detachment 9th Battery 2nd Brigade, on the 29th February, 1868. The Barracks are situated within Fort Canning, on a hill, at an elevation of about 150 feet, having the town between it and the bay, from which it is about half a mile distant. The aspect of the barrack rooms (facing the parade ground) is north-east. It is generally considered one of the coolest and most desirable positions in the island. The men's barrack rooms are arranged in the form of a gentle curve, having the quarters for the married soldiers at each end, each quarter being divided by a movable screen into two compartments. At the opposite side of the parade ground are the guard and recreation rooms, canteen, &c. All the buildings are of good brick, roofed with tiles, and raised nearly three feet from the ground, having a verandah in front of the whole length of the building.

The general construction of the barracks is excellent. The rooms are lofty, spacious, and well ventilated. There is only one room for all ablution, bathing, and washing purposes for the use of each battery; this contains two wooden baths, basins, &c. There is no plunge or swimming bath here for the men, so that bathing (which is so necessary an adjunct to health in this climate) is rendered almost impossible, and the want of it is severely felt by the men. A swimming bath was constructed at the foot of the hill some time since, but it was not paved (the excavation merely having been made), and it is now but a large mud hole, totally useless for cleansing purposes, and from the quantities of mud and gravel contained, so injurious to the eyes and ears of those using it, that the Medical Officer in charge was obliged to recommend its disuse.

The quality of the water has been good; the supply is obtained from wells by means of pumps, worked by coolies, (occasionally deficient, however, from

accidents to the machinery). Temporary stoppages have occurred, but on my recommendation have been obviated. Sanitary arrangements are generally satisfactory, and there is no local cause of disease. The daily ration consists of 1¼ lb. bread, 1¼ lb. beef, 14 ozs. fresh vegetables, 2 ozs. rice, ⅘ oz. tea, or 1⅘ oz. coffee, 2½ ozs. sugar, 1 oz. salt, and 1 ration of fuel, consisting of 3 lb. wood to each man. The cooking is varied as desired by the men. Married men draw 3 rations of fuel. Gas is supplied to the whole of the quarters. *Straits Settlements.*

The clothing in general use by the men is white twill or cotton tunics and trousers, their wicker helmets being cased with a similar material. The last-mentioned article is the only one provided by Government. This dress is suitable in every respect to the climate, and the men scarcely ever wear the Government uniform. As the men do not get increased pay here, it is rather a heavy tax on them to supply themselves with the only clothing suitable for wear in this climate at their own expense. The clothing issued to the troops has been the usual home thick blue cloth, with forage cap.

Venereal disease has been exceedingly prevalent, being in the proportion for the past year of five to three, of all other zymotic diseases, and it is, unfortunately, on the increase."

XIII.—ON THE HEALTH OF THE TROOPS SERVING IN INDIA.

Section I.

Sickness and Mortality.

India. The average strength of the European troops for the year 1868 was 52,887; the admissions into hospital were 70,232, and the death 1,148, of which 1,030 occurred within the limits of the Command, and 118 among the invalids on their passage to England or at Netley. The admissions therefore were in the ratio of 1,328, and the deaths of 21·70 per 1,000 of mean strength, both considerably lower than in the preceding year.

The admissions and deaths in each of the Presidencies were as follows :—

	Average Strength.	Admissions into Hospital.	Deaths.			Ratio per 1000 of Mean Strength.			
						1868.		1860–67.	
			In India.	Of Invalids.	Total.	Admitted.	Died.	Admitted.	Died.
Bengal	32,909	45,234	686	69	755	1,374	22·93	1,704	30·62
Madras	10,158	14,214	208	33	241	1,399	23·72	1,395	22·01
Bombay	9,820	10,784	136	16	152	1,098	15·48	1,567	24·44

The ratio of sickness and mortality was a little higher than in 1867 in Madras, but in Bengal and Bombay there was a marked reduction.

Compared with the average of preceding years the admissions and deaths in Bengal and Bombay show a very satisfactory decrease, but in Madras a very trifling increase.

I. Bengal.

STATISTICAL REPORT.

Bengal. The mean strength of European troops in the Presidency during the year under review amounted to 32,909 non-commissioned officers and men; among whom 45,234 admissions into hospital were recorded; there were 686 deaths among them in India and 69 among the invalids on their passage home and at Netley, making a total of 755. These numbers give the ratio of 1,374 admissions and 22·93 deaths per 1,000 of mean strength, the former being 33 and the latter 10·97 per 1,000 lower than in the preceding year.

The following Table framed from Abstract No. 25 in the Appendix shows the admissions and deaths by the different classes of diseases :—

Orders.	Diseases.	1868. Strength, 32,909. Admitted.	Died. In India.	Died. Of Invalids.	Died. Total.	1868. Ratio per 1,000. Admitted.	1868. Ratio per 1,000. Died.	1860–67. Ratio per 1,000. Admitted.	1860–67. Ratio per 1,000. Died.
	Class I.								
1	Miasmatic Diseases ..	22,153	226	14	240	673·2	7·29	931·1	16·84
2	Enthetic „ ..	6,214	5	5	10	188·8	·30	268·7	·33
3	Dietic „ ..	793	6	..	6	24·1	·18	12·3	·18
4	Parasitic „ ..	272	..	..	..	8·3	..	8·3	..
	Class II.								
1	Diathetic Diseases ..	309	10	3	13	9·4	·40	8·0	·22
2	Tubercular „ ..	348	57	22	79	10·6	2·40	11·0	2·50
	Class III. Diseases of the—								
1	Nervous System ..	1,415	43	3	46	43·0	1·40	34·8	1·88
2	Circulatory „ ..	396	50	6	56	12·0	1·70	10·4	·99
3	Respiratory „ ..	1,561	28	2	30	47·5	·91	54·7	1·15
4	Digestive „ ..	3,719	119	11	130	113·0	3·95	134·6	3·72
5	Urinary „ ..	105	6	1	7	3·2	·21	2·7	·17
6	Reproductive „ ..	492	..	..	..	14·9	..	15·2	..
7	Locomotive „ ..	211	1	..	1	6·4	·03	5·7	·02
8	Integumentary „ ..	3,265	3	1	4	99·2	·12	103·5	·05
	Class IV.								
4	Diseases of Nutrition.	441	2	..	2	13·4	·06	9·5	·20
	Class V.								
1	Accidents	3,512	113	..	113	106·7	3·43	88·3	1·70
2	Battle..	..	..	..	..	..	..	·6	·17
3	Homicide	..	2	..	2	..	·06	..	·02
4	Suicide	4	13	1	14	·1	·43	·1	·31
5	Execution	..	2	..	2	..	·06	..	..
6	Corporal Punishment	1	..	..	..	..	..	1·0	..
	Diseases not specified.	23	..	..	..	·7	..	3·1	·17
	Total	45,234	686	69	755	1374·5	22·93	1703·6	30·62

The reduction in the admissions and deaths compared with the results for 1867 has been chiefly in miasmatic diseases.

MIASMATIC DISEASES when subdivided give the following results:—

Bengal.

Diseases.	Admitted.	Died.	Annual Ratio per 1,000 Strength. 1868. Admitted.	1868. Died.	1860-67. Admitted.	1860-67. Died.
Eruptive Fevers..	47	..	1·4	..	2·4	·32
Paroxysmal ,, ...	11,344	40	344·7	1·21	473·9	2·13
Continued ,, ...	3,327	66	101·1	2·01	134·0	1·41
Dysentery and Diarrhœa	3,653	61	111·0	1·85	138·3	3·70
Spasmodic Cholera..	71	53	2·2	1·61	13·6	8·48
Sorethroat and Influenza	729	2	22·2	·06	20·6	·02
Ophthalmia	824	..	25·0	..	49·1	..
Rheumatism	1,682	3	51·1	·09	69·8	·07

Eruptive Fevers furnished nearly the same proportion of cases as in 1867, but no deaths. Smallpox and measles were the most prevalent diseases of the class, 18 cases of the former, and 23 of the latter, having been admitted into hospital.

Paroxysmal Fevers were less prevalent and fatal than in 1867; the admissions were nearly one-fourth under the average of the preceding eight years, and the deaths also were much under it.

Continued Fevers show an increase upon the ratio of the preceding year though still considerably below the average. The increase was not sufficient to counterbalance the decrease in paroxysmal fevers.

Dysentery and Diarrhœa also show a satisfactory reduction, and particularly in the deaths, which amounted only to half the average.

Spasmodic Cholera was less prevalent and fatal than in any of the preceding eight years except 1866, in which the proportion of cases was the same, and of deaths a fraction lower than in the year now under review.

Ophthalmia gave only half the average amount of cases, and was 7 per 1,000 under the proportion in the preceding year.

Enthetic Diseases though much under the average of the preceding eight years, were 25 per 1,000 above the proportion in 1867; the increase was chiefly, though not exclusively, in cases of gonorrhœa.

Diseases of the Nervous System were one-fifth above the average, but the increase was due almost entirely to cases returned as headache (*cephalœa*), and inflammation of the ear (*otitis*). The ratio of mortality by this class was the same as in 1867, and a little below the average.

Diseases of the Respiratory System were considerably under the average, but the deaths have not undergone a corresponding reduction. Bronchitis was the most prevalent, and pneumonia the most fatal disease.

Accidents and Violence were above the average both in admissions and deaths; indeed the ratio of the latter, under the head of accidents, was exactly double the average, the difference being chiefly due to deaths from heat apoplexy, or sunstroke. Under this head were returned 253 admissions and 83 deaths. There were 14 suicidal, 2 homicidal, and 2 judicial deaths.

The admissions and deaths at each of the principal stations in the Bengal Command are shown in the following Table. For the purposes of comparison columns have been added showing the ratio of admissions and deaths on the average of the three preceding years.

Stations.		Average Annual Strength.	Admitted into Hospital.	Died in India.	Annual Ratio per 1,000. Admitted.	Annual Ratio per 1,000. Died.	Annual Ratio per 1,000. 1865–67. Admitted.	Annual Ratio per 1,000. 1865–67. Died.
Presidency	Calcutta	798	1,085	28	1359·6	35·08	1830·0	26·33
	Dum Dum ..	214	331	3	1546·7	14·01		
	Barrackpore ..	385	704	16	1828·6	41·55	1923·8	31·63
	Chinsurah ..	302	977	33	3235·1	109·27	..	..
	Berhampore ..	183	643	12	3513·6	65·57	1875·0	10·63
	Hazarecbaugh ..	104	187	2	1798·1	19·23	1625·3	21·04
	Seuchal	181	190	..	1049·7	..	..	..
	Darjeeling ..	215	233	..	1083·7	..	..	..
Allahabad	Allahabad ..	936	1,756	29	1876·1	30·98	1572·7	33·23
	Cawnpore ..	696	921	16	1323·3	22·98	1346·8	20·07
	Dinapore	854	1,350	22	1580·8	25·76	1611·9	20·84
	Benares	634	906	14	1429·0	22·08	1992·3	31·54
Oude ..	Lucknow	2,221	2,715	50	1222·4	22·51	1218·5	18·85
	Seetapore.. ..	414	554	12	1369·3	28·98	1054·5	17·67
	Fyzabad	824	679	9	824·0	10·92	1195·7	31·34
Saugor ..	Saugor	759	1,281	22	1687·7	28·98	2483·6	34·82
	Nowgong.. ..	189	137	3	724·8	15·87	1195·4	19·93
	Jubbulpore ..	683	847	19	1240·1	27·81	2302·6	28·24
Rohilcund	Bareilly	870	759	15	872·4	17·24	990·0	12·00
	Shahjehanpore ..	311	308	7	990·3	22·50	1654·2	24·70
	Moradabad ..	267	248	2	928·8	7·49	1189·8	12·73
Gwalior ..	Morar	774	1,344	13	1736·4	16·79	1924·4	26·77
	Fortress Gwalior	219	201	3	917·8	13·70	1367·3	28·25
	Jhansi	560	1,109	8	1980·4	14·29	2153·6	16·74
	Seepree	119	214	1	1798·3	8·40	1898·6	10·86
Meerut ..	Meerut	1,607	2,080	30	1294·3	18·67	1650·3	40·39
	Agra	883	925	10	1047·6	11·32	1520·0	23·77
	Delhi	289	721	4	2494·8	13·84	1544·9	32·23
	Muttra	409	386	9	943·8	22·01	1067·6	17·34
	Roorkee	290	258	8	889·7	27·59	1292·2	18·48
	Futtyghur ..	237	231	6	974·7	25·32	1341·4	21·50
Sirhind ..	Umballah ..	938	1,442	14	1537·3	14·92	1435·1	17·03
	Jullundur ..	591	1,203	24	2035·5	40·61	1286·9	11·73
	Dugshai	601	418	4	695·5	6·65	970·2	10·67
	Phillour	61	188	4	3082·0	65·57	1761·5	22·93
	Subathoo ..	567	492	5	689·3	8·82	1611·5	16·59
Lahore ..	Meean-Meer ..	1,038	2,126	24	2048·2	23·12	..	..
	Fort Lahore ..	69	208	2	3014·5	28·99	1805·6	41·57
	Umritsir	99	81	4	818·2	40·40	..	..
	Fort Kangra ..	69	69	2	985·5	28·99	1131·9	12·76
	Fort Govindghur	24	25	..	1041·7	..	1112·7	16·78
	Sealkote	1,092	1,439	10	1317·8	9·16	1244·3	8·27
	Ferozepore ..	807	1,162	8	1439·9	9·91	1555·5	17·98
	Mooltan	774	988	16	1276·5	20·67	1004·4	19·37
Peshawur	Peshawur ..	1,653	3,367	25	2036·9	15·12	2217·2	48·33
	Rawul Pindee ..	1,468	2,010	16	1369·2	10·89	1305·8	10·86
	Campbellpore ..	242	225	3	929·7	12·40	1273·5	16·38
	Attock	164	260	1	1585·4	6·10	1539·1	20·04
	Nowshera.. ..	588	918	6	1561·2	10·20	1899·5	20·51
	Dera Ismael Khan	99	101	..	1020·2	..	766·9	6·47
	Sydun Bowlie ..	78	71	1	910·3	12·82	..	..
	Murree	41	86	..	2097·6	..	..	..
On Field Service		181	313	5	1729·3	27·62	..	..
Troops on March, detached, &c.		1,241	1,368	68	1102·4	54·79	..	..
Convalescent Stations and Depôt Hospitals ..		968	1,935	38	1,998·9	39·25	..	..

Bengal. The admissions into hospital were extremely high at Chinsurah, Berhampore, Phillour, Fort Lahore, and Delhi, and were also considerably above the average of the Command at Jullundur, Meean-Meer, Peshawur, and Murree. The mortality also was greatly above the average at Chinsurah, Berhampore, Phillour, Barrackpore, Jullundur, Umritsir, Calcutta, and on the march. The great amount of sickness and mortality at Chinsurah is probably due in a great measure to its being the depôt for men arrived from England *en route* to join their corps, and for such invalids as are sent home from Bengal by the Cape of Good Hope. It is understood that in future drafts from England will not be detained there, but sent at once to their corps.

The high ratio of mortality on the march was due to special circumstances. In the middle of August it was decided to send a field force into the Hazara country to punish the hill tribes, and to form part of this force the D Battery F Brigade Royal Horse Artillery, the E Battery 19th Brigade Royal Artillery, the 1st Battalions 6th and 19th Regiments at Rawul Pindee, the 2nd Battery 24th Brigade of Royal Artillery at Meean-Meer, and the 38th Regiment at Sealkote, were ordered to proceed by forced marches to Abbottabad, and thence more leisurely by Monserah and Khakee to Oghee, where they joined a force composed of Native troops of Her Majesty's Service and troops of the Rajah of Cashmere. The short and decisive operations which followed gave rise to very little sickness and no casualties of war among the European troops. In the forced marches, however, undertaken during the hot weather, to reach the rendezvous, the 1st Battalion 6th and the 38th Regiments suffered severely from sunstroke; the former had 46 cases and 7 deaths, and the latter 41 cases and 6 deaths on the march. It is worthy of remark that the 1st Battalion 19th Regiment marched from Rawul Pindee to Abbottabad, a distance of 63 miles, in three consecutive days without having a single case of heat appoplexy, and the three batteries of Artillery enjoyed a like immunity.

The following Table shows the admissions and deaths by the different classes of diseases in each of the Military Divisions:—

Class	Military Divisions	Presidency.		Allahabad.		Oude.		Saugor.		Rohilcund.		Gwalior.		Meerut.		Sirhind.		Lahore.		Peshawur.		Troops on March and Men detached		Convalescent Stations and Depôts.	
	Average Strength	2,385		3,120		3,458		1,630		1,447		1,674		3,715		2,764		3,977		4,539		1,198		965	
	Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
	Class I.																								
1	Miasmatic Diseases	2,037	57	1,858	20	1,296	22	1,149	20	413	4	1,655	2	2,171	18	2,155	21	2,949	24	4,588	22	562	16	332	6
2	Enthetic ,, ...	675	1	1,024	...	756	...	304	...	415	...	297	...	514	...	304	...	579	1	804	...	240	...	252	1
3	Dietic ,, ...	75	1	97	1	311	1	16	...	17	...	45	1	36	...	28	...	77	1	55	1	3	...	12	...
4	Parasitic ,, ...	13	...	15	...	25	...	20	...	1	...	8	...	18	...	53	...	52	...	51	...	3	...	5	...
	Class II.																								
1	Diathetic Diseases	30	...	41	2	18	1	10	...	12	...	45	...	29	2	36	...	57	...	43	3	9	2	10	...
2	Tubercular ,, ...	36	6	50	5	34	3	36	7	5	2	21	3	56	3	11	4	34	6	49	4	6	8	40	3
	Class III.																								
	Diseases of the—																								
1	Nervous System	164	3	160	5	124	2	30	1	33	3	67	1	124	6	103	5	418	6	95	3	26	7	77	1
2	Circulatory ,, ...	28	2	61	9	47	7	26	2	22	2	24	2	46	4	26	2	56	3	35	7	8	2	26	4
3	Respiratory ,, ...	153	1	120	7	128	3	63	1	19	2	71	1	234	2	177	2	298	3	240	4	40	3	51	2
4	Digestive ,, ...	404	17	492	13	339	8	236	10	131	9	168	5	419	17	241	8	461	2	460	6	76	4	333	19
5	Urinary ,, ...	11	...	15	1	10	2	5	1	7	...	3	1	7	...	6	...	13	...	24	1	2	...	3	...
6	Reproductive ,, ...	41	...	60	...	55	...	33	...	22	...	35	...	62	...	31	...	63	...	57	...	16	...	29	...
7	Locomotive ,, ...	10	...	29	...	22	...	5	...	7	...	14	...	18	...	24	...	26	...	31	...	15	1	25	...
8	Integumentary ,, ...	304	...	441	2	347	...	143	...	102	...	166	...	417	...	225	...	502	1	393	1	88	...	66	...
	Class IV.																								
4	Diseases of Nutrition	71	...	77	...	43	...	18	...	24	...	13	1	43	...	14	...	35	...	53	...	11	...	82	2
	Class V.																								
1	Accidents	297	6	387	14	391	17	170	1	84	2	238	8	406	14	305	6	481	14	415	4	192	25	87	...
3	Homicide	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	Suicide	...	...	1	2	1	3	...	1	1	...	1	...	...	1	...	3	...	5	...	...	...	...	...	...
5	Execution...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...
6	Corporal Punishment	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
	Diseases not specified	7	...	5	...	1	...	1	...	2	...	2	...	1	...	8	...	3	...	8	...	...	...	2	...
	General Total	4,356	94	4,933	81	3,948	71	2,265	44	1,318	24	2,873	25	4,602	67	3,747	51	6,104	66	7,401	57	1,295	68	1,932	38

RATIO per 1,000 of Mean Strength.

Class.	Military Divisions ...	Presidency.		Allahabad.		Oude.		Saugor.		Rohilcund.		Gwalior.		Meerut.		Sirhind.		Lahore.		Peshawur.		Troops on March and Men detached.		Depôts.	
	Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
	Class I.																								
1	Miasmatic Diseases... ...	854·1	23·90	595·5	6·41	374·8	6·36	704·9	12·27	285·4	2·77	988·6	1·19	584·4	4·84	779·7	7·60	741·5	6·04	1010·8	4·85	469·1	13·36	862·2	6·22
2	Enthetic ,, ...	283·0	·42	328·2	...	218·6	...	186·5	...	286·8	...	177·4	...	138·4	...	110·0	...	145·6	·25	177·1	...	200·3	...	261·1	1·04
3	Dietic ,, ...	31·4	·42	31·1	·32	89·9	·29	9·8	...	11·8	...	26·9	·60	9·7	...	10·1	...	19·4	·25	12·1	·22	2·5	...	12·4	...
4	Parasitic ,, ...	5·4	...	4·8	...	7·2	...	12·3	...	·7	...	4·8	...	4·8	...	19·2	...	13·1	...	11·2	...	2·5	...	5·2	...
	Class II.																								
1	Diathetic Diseases... ...	12·6	...	13·1	64	5·2	·29	6·1	...	8·1	...	26·9	...	7·8	·54	13·0	...	14·3	...	9·5	·66	7·5	1·67	10·4	...
2	Tubercular ,, ...	15·1	2·52	16·0	1·60	9·8	·87	22·1	4·30	3·5	1·38	12·5	1·79	15·1	·81	4·0	1·45	8·6	1·51	10·8	·88	5·0	6·68	41·4	3·11
	Class III.																								
	Diseases of the—																								
1	Nervous System ...	68·8	1·25	51·3	1·60	35·9	·58	18·4	·61	22·8	2·07	40·0	·60	33·4	1·61	37·2	1·81	105·1	1·51	20·9	·66	21·7	5·84	79·8	1·04
2	Circulatory ,, ...	11·7	·84	19·6	2·88	13·6	2·02	16·0	1·23	15·3	1·38	14·3	1·19	12·4	1·08	9·4	·72	14·1	·75	7·7	1·54	5·0	1·67	26·9	4·14
3	Respiratory ,, ...	64·2	·42	38·5	2·25	37·0	·87	38·7	·61	13·1	1·38	42·4	·60	63·0	·54	64·0	·72	74·9	·75	52·9	·88	33·4	2·50	52·9	2·07
4	Digestive ,, ...	169·4	7·12	157·7	4·17	98·0	2·31	144·8	6·14	90·5	6·22	100·4	2·98	112·8	4·57	87·2	2·89	115·9	·50	101·4	1·32	63·4	3·34	345·1	19·69
5	Urinary ,, ...	4·6	...	4·8	·32	2·9	·58	3·1	·61	4·8	...	1·8	·60	1·9	...	2·2	...	3·3	...	5·3	·22	1·7	...	3·1	...
6	Reproductive ,, ...	17·2	...	19·2	...	15·9	...	20·2	...	15·3	...	20·9	...	16·7	...	11·2	...	15·8	...	12·6	...	13·4	...	30·0	...
7	Locomotive ,, ...	4·2	...	9·3	...	6·4	...	3·1	...	4·8	...	8·4	...	4·8	...	8·7	...	6·5	...	6·8	...	12·5	·83	25·9	...
8	Integumentary ,, ...	127·5	...	141·4	·64	100·4	...	87·7	...	70·5	...	99·2	...	112·2	...	81·4	...	126·2	·25	86·6	·22	73·5	...	68·4	...
	Class IV.																								
4	Diseases of Nutrition ...	29·8	...	24·7	...	12·4	...	11·0	...	16·6	...	7·8	·60	11·6	...	5·1	...	8·8	...	11·7	...	9·2	...	85·0	2·07
	Class V.																								
1	Accidents	124·5	2·52	124·0	4·49	113·1	4·91	104·3	·61	58·1	1·38	142·2	4·78	109·3	3·77	110·3	2·17	120·9	3·52	91·4	·88	160·5	20·87	90·2	...
3	Homicide	...	...	...	...	...	·29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	Suicide	...	...	...	·3	·64	·3	·87	...	·61	·7	...	·6	...	·27	...	1·09	...	1·26	...	...	...	...	...	...
5	Execution	...	...	...	...	...	...	·29	...	...	...	...	...	...	...	...	...	...	...	...	·22	...	...	...	...
6	Corporal Punishment ...	...	...	...	...	...	...	...	...	...	·7	...	...	...	·2	...	...	...	...	...	...	...	...	...	...
	Diseases not specified ...	2·9	...	1·6	...	·3	...	·6	...	1·4	...	1·2	...	·2	...	2·9	...	·8	...	1·8	...	...	...	2·1	...
	General Total	1826·4	39·41	1581·1	25·96	1141·7	20·53	1389·6	26·99	910·9	16·58	1716·3	14·93	1238·7	18·03	1355·6	18·45	1534·8	16·59	1630·6	12·55	1081·0	56·76	2002·1	39·38

MIASMATIC DISEASES were less prevalent than in 1867 in all the divisions except the Presidency, Sirhind, and Peshawur, which show an increase. There has been a decrease in the proportion of deaths by these diseases in all the divisions but the Presidency and Saugor, the former of which has furnished the highest ratio in the Command. *Bengal.*

The following Table shows the influence of these diseases on the sickness and mortality in the different Military Divisions :—

Military Divisions.	Eruptive Fevers.		Paroxysmal Fevers.		Continued Fevers.		Dysentery and Diarrhœa.		Spasmodic Cholera.		Sorethroat and Influenza.		Ophthalmia.		Rheumatism.	
	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Presidency	3	..	728	7	370	7	586	15	34	27	99	..	54	..	118	1
Allahabad	6	..	906	4	70	3	430	10	6	3	71	..	96	..	230	..
Oude	1	..	380	3	219	5	308	8	5	5	51	..	97	..	174	1
Saugor	6	..	759	5	38	..	158	3	13	12	30	..	43	..	76	..
Rohilcund	..	..	164	..	38	3	96	1	1	..	18	..	33	..	51	..
Gwalior	..	..	1,133	..	163	1	127	1	1	..	52	..	39	..	90	..
Meerut	6	..	1,090	8	246	7	338	3	2	..	79	..	125	..	232	..
Sirhind	3	..	1,345	5	228	10	289	5	..	..	45	1	73	..	148	..
Lahore	5	..	1,525	3	474	14	389	7	..	..	119	..	143	..	194	..
Peshawur	8	..	2,392	5	1,240	7	525	7	..	1	78	1	81	..	226	1
On March	5	..	265	1	85	8	115	1	6	4	13	..	16	..	54	2
Depôts	..	..	466	1	41	2	148	3	..	..	38	..	26	..	108	..
Ratio per 1,000 of Mean Strength.																
Presidency	1·3	..	305·2	2·93	155·1	2·93	245·7	6·29	14·3	11·32	41·5	..	22·6	..	49·5	·42
Allahabad	1·9	..	290·4	1·28	22·4	·96	137·8	3·21	1·9	·96	22·8	..	30·8	..	73·7	..
Oude	·3	..	109·9	·87	63·3	1·45	89·1	2·31	1·4	1·45	14·7	..	28·1	..	50·3	·28
Saugor	3·7	..	465·6	3·07	23·3	..	96·9	1·84	8·0	7·36	18·4	..	26·4	..	46·6	..
Rohilcund	..	..	113·3	..	26·3	2·07	66·3	·69	·7	..	12·4	..	22·8	..	35·3	..
Gwalior	..	..	676·8	..	97·4	·60	75·9	·60	·6	..	31·1	..	23·3	..	53·7	..
Meerut	1·6	..	293·4	2·15	66·2	1·89	91·0	·81	·5	..	21·3	..	33·7	..	62·5	..
Sirhind	1·1	..	486·6	1·81	82·5	3·62	104·6	1·81	..	..	16·3	·36	26·4	..	53·5	..
Lahore	1·2	..	383·5	·75	119·2	3·52	97·8	1·76	..	..	29·9	..	36·0	..	48·8	..
Peshawur	1·8	..	527·0	1·10	273·2	1·54	115·7	1·54	..	·22	17·2	·22	17·8	..	49·8	·22
On March	4·2	..	221·2	·84	70·9	6·68	96·0	·84	5·0	3·34	10·8	..	13·4	..	45·1	1·66
Depôts	..	..	482·9	1·04	42·5	2·07	153·4	3·11	..	..	39·4	..	26·9	..	111·9	..

Eruptive Fevers did not prevail as an epidemic among the men at any of the stations. The Saugor Division furnished the highest proportion of cases, chiefly from the occurrence of three of modified smallpox and one of measles at Jubbulpore. There was no death from them throughout the Command. *Bengal.*

Paroxysmal Fevers.—There was a marked increase in the prevalence of this group of fevers in the Sirhind Division, a moderate increase in the Presidency and Peshawur Divisions, and a very trifling one in the Oude; in all the others the ratio was lower than in the preceding year. The Gwalior Division furnished the highest ratio of admissions, amounting to 677 per 1,000, or equal to two-thirds of the average strength; next to it, the Peshawur, the Sirhind, and the Saugor Divisions. The great excess of these fevers in the Gwalior Division occurred in the 93rd Regiment at Jhansi, which had 541 cases in a strength of 702 men, and the Batteries of the 22nd and 24th Brigades Royal Artillery at Morar, which had respectively 46 cases in 72 and 37 cases in 65 men. The other two batteries at Morar had a moderate, and the battery at Jahnsi a decidedly low rate of admissions. In the Peshawur Division the excess was manifest in all the corps quartered at Peshawur, but particularly the Artillery, in the 77th Regiment at Nowshera, and in the E Battery 19th Brigade Royal Artillery at Rawul Pindee, but in both of the latter the Medical Officers referred much of the prevalence to their having been stationed at Peshawur during the previous year. The other corps at Rawul Pindee had not a large amount of admissions by this group. In the Sirhind Division the high ratio was due to the 92nd Regiment at Jullundur, which had 563 cases in a strength of 783, and to the 21st Hussars, which had 152 cases in 341, the A Battery F Brigade Royal Horse Artillery 70 in 132, and the 106th, which had 482 cases in a strength of 765 at Umballa. The battery of Artillery at Jullundur, the 90th Regiment at Subathoo, and the 104th at Dugshai, had comparatively a small proportion of cases. In the Saugor Division these fevers were very prevalent in the Royal Artillery at Saugor and Jubbulpore, and in the 1st Battalion 7th Regiment at the former station. The Artillery had 253 cases in a strength of 325, and the 7th Regiment 433 in a strength of 768 men; the 2nd Battalion 12th Regiment at Jubbulpore, with three companies at Nowgong, had only 180 cases among 808 men. The increased ratio of admissions by fevers of this type in the Presidency Division was due to their great prevalence in the right wing of the 2nd Battalion 25th Regiment at Berhampore. This corps arrived at Calcutta from Ceylon towards the end of January; after a short detention at Dum Dum, the head-quarters and right wing were sent to Shahjehanpore, and the left wing to Berhampore, with a detachment at Barrackpore till the middle of June. On the 19th of November the wing left Berhampore to join head-quarters. Between the 28th February, the date of the wing arriving at Berhampore, and the 19th November, when it left, 418 cases of paroxysmal fevers occurred in an average strength of 363 men, and of these 5 died. The wing at Shahjehanpore during the same period in an average of 486 men had only 25 cases. At Berhampore the officers enjoyed a marked exemption from these fevers, but they are stated to have been very prevalent among the native troops at the station, and the civil population. The comparatively high ratio in the Lahore Division was chiefly due to the large number of cases in the 85th Regiment, which had arrived early in the year from England and was quartered at Meean-Meer. Between the 11th March and 31st December this corps had 609 admissions by paroxysmal fevers.

Continued Fevers were more prevalent than in 1867 in the Presidency, Saugor, Rohilcund, Sirhind, and Peshawur Divisions, but less prevalent in all the others. The Presidency Division was that in which the increase was most marked. In the first of these it occurred chiefly in the 2nd Battalion 60th Regiment at Fort William, and the depôt at Chinsurah; in the Gwalior, chiefly in the 93rd at Jhansi; in the Sirhind Division, in the 92nd Regiment at Jullundur and Phillour; and in the Peshawur, in the Royal Horse Artillery, the 36th, and 88th Regiments at Peshawur, and the 1st Battalion 6th Regiment at Rawul Pindee. The 4th Hussars at Meerut, and the 1st Battalion 5th Regiment at Ferozepore, also had a high proportion of cases. Their prevalence was generally attributed to solar influence, but in some instances, and particularly at Peshawur, they were believed to be of malarious origin.

Bengal. *Dysentery and Diarrhœa* were much less prevalent than in 1867 in all the divisions except the Presidency and Allahabad, in both of which there was an increase. The Presidency furnished a much higher ratio of cases than any of the other divisions. This was chiefly due to the prevalence of diarrhœa at Chinsurah in the second quarter of the year, when 167 cases occurred in an average strength of 319 men. Cholera was prevalent at the depôt at the same time. The admissions by dysentery and diarrhœa were also considerably above the average in the 2nd Battalion 60th Regiment in Fort William. The excess of these diseases in the Allahabad Division was chiefly in the 105th Regiment at Dinapore, and, though to a less extent, in the 107th at Allahabad.

Spasmodic Cholera did not prevail as an epidemic during the year at any of the stations except Chinsurah and Jubbulpore. At the former it broke out three times—early in April, in the middle of May, and in the middle of June. Previously to the first outbreak, cholera prevailed at a village about a mile and a quarter from Chinsurah, but on the opposite side of the river, and all communication between the two places had been interdicted. On the 7th April, the day following the arrival of some drafts from England by the river, the first case occurred, and between that date and the 16th four deaths occurred among the troops. The disease then ceased but broke out again about the 20th May, and on that and the two following days six men died. The troops then remained free from it till the 20th June, when it again appeared and caused five deaths in four days. No more cases occurred till the middle of November when one man died, but the disease did not spread. There was also a fatal sporadic case in March and another in December. On each of these occasions the outbreak was preceded by heavy falls of rain. The men *en route* from England are stated to have suffered more severely than the others, 14 of the deaths having occurred among them and only one among the invalids, and two among volunteers waiting an opportunity of joining their new corps; but as we have no information respecting the numbers of each exposed to the risk, we are unable to attach a correct value to this statement.

At Jubbulpore the first case of cholera among the troops occurred in the 2nd Battalion 12th Regiment on the 25th of May, and the second in the Royal Artillery on the following day. On the 11th June the troops were moved into camp and did not re-occupy the barracks till the 29th; during that period nine deaths by it occurred. In the end of July there were two more cases in the Royal Artillery, both of which terminated fatally. The Artillery lost five and the 12th Regiment six men. The disease was supposed to have been introduced by some coolies who were at work upon the Nagpore Road, about 55 miles from Jubbulpore, and among whom the disease was prevalent for some time previously, but the evidence on this head is not very satisfactory.

The right wing of the 2nd Battalion 25th Regiment to which we have already alluded as having suffered so much from fever at Berhampore, had seven cases and five deaths of cholera at that station. Two of the deaths occurred in May and three in July; the disease was not considered to have assumed an epidemic form, and it was not deemed necessary to remove the regiment into camp.

Ophthalmia did not prevail to a great extent in any of the Military Divisions or in any corps. The 8th Brigade Royal Artillery furnished the largest number of admissions, amounting to 50, but this was due entirely to the occurrence of 27 cases in the H Battery at Agra, attributed by the Medical Officer to the fine dust during the hot season. The other battery of Artillery, however, and the Line Regiment at the same station did not suffer from the disease, although exposed to the same cause.

Enthetic Diseases were more prevalent than in 1867 in all the Military Divisions except the Meerut Division, in which there was a considerable decrease, and the Sirhind, in which the results for the two years were identical. So far therefore as the prevalence of these diseases in the Army may be taken as an index, the establishment of lock hospitals does not seem as yet to have produced satisfactory results. The regiments in which primary syphilis caused the greatest number of admissions were the 2nd Battalion 25th, in the Presidency and Rohilcund Divisions, the 36th in the Peshawur, the 107th in the

Allahabad, and the 105th in the Meerut Division. The latter corps had the largest number of cases of secondary syphilis. Gonorrhœa was most prevalent in the 37th Regiment in the Rohilcund, the 102nd in the Oude, the 107th in the Allahabad, the 2nd Battalion 12th in the Saugor, and the 38th in the Lahore Division. The Allahabad Division continues to furnish the highest proportion of enthetic diseases in the Bengal Command. *Bengal.*

Dietic Diseases were greatly above the average in the Oude Division, but this was entirely due to 246 cases having been returned under the head of intemperance (*ebriositas*) by the Medical Officer in charge of the 55th Regiment at Lucknow, and which he attributes "to the increase of pay issued "during the year." A careful examination of the Reports and of the Returns of Courts-Martial for drunkenness in this as compared with other corps has failed to throw any light on the subject, and we cannot but think that Surgeon-Major Parr has included under this heading many cases which in other corps would be returned as slight fever, dyspepsia, &c.

Diseases of the Nervous System.—The admissions by this class were greatly above the average in the Lahore Division, and the deaths were high among troops on the march. The excess in the admissions was caused by the large number of 163 cases returned as headache (*cephalœa*) in the 85th Regiment, which had just arrived at Meean-Meer from England. These were probably the result of exposure to the sun by the men before they had become habituated to the customs of the country, and who were ignorant of the injurious consequences of such exposure. It also had 36 admissions by inflammation of the ear (*otitis*). This corps therefore in these two diseases furnished nearly half the admissions by this class in the whole of the Division. The high ratio of deaths by this class was among troops on the march.

Diseases of the Digestive System show a considerable decrease on the results for 1867 in the Rohilcund, Gwalior, Sirhind, and Meerut Divisions; in Lahore there was an increase, and in the other divisions the difference between the two years was unimportant. With the exception of miasmatic and enthetic diseases this class furnished the highest proportion of admissions in the Command. The most prevalent and almost the only fatal disease of this class has been inflammation of the liver, and next to it in point of frequency has been dyspepsia.

Diseases of the Integumentary System were more prevalent than in 1867 in all the Divisions except the Saugor and Rohilcund, in both of which there was a marked reduction. Boils, ulcers, and abscesses were the chief diseases. At Delhi only three cases of the peculiar Delhi sore were admitted into hospital during the year, one from the Royal Artillery, and two from the wing of the 79th Regiment. The sore is not only very much less prevalent than formerly, but has also assumed a much milder character.

Accidental and Violent Deaths were in a higher ratio to the strength than in 1867 in the Presidency, Allahabad, Oude, Meerut, and Sirhind, and in a lower ratio in the other Divisions. Of the 98 deaths included in the group of accidental 84 appear under the head of sunstroke or heat appoplexy. We have already noticed the high mortality by this cause in the 6th and 38th Regiments on the march during the hot season to join the Hazara field force. The divisions in which the deaths by sunstroke were most numerous were the Oude, Meerut, and Allahabad; the stations were Lucknow, which had 11; Meerut, 8; Morar, 5; and Allahabad, 4. The Corps which had the greatest number of deaths, exclusive of the 6th and 38th Regiments on the march, were the 8th Brigade, R.A., the batteries of which occupied seven different stations, and which had 12 deaths, the 102nd at Lucknow, which had 7, and the 1st Battalion 3rd, the 85th, 92nd, and 103rd Regiments, which each had four deaths.

The admissions into hospital and deaths in each Corps serving in Bengal in 1867 are shown in the following Table :—

Bengal.

Corps.	Average Strength for the Year.	Admitted into Hospital.	Died.			Annual Ratio per 1,000.		Stations during the Year.
			In India.	Of Invalids.	Total.	Admitted.	Died.	
CAVALRY.								
4th Hussars	427	929	11	..	11	2175·6	25·76	On march, 1⅓ month; Meerut, 10⅔ months.
5th Lancers	455	440	12	2	14	967·0	30·77	Lucknow, 12 months.
7th Hussars	401	360	8	..	8	897·8	19·95	Sealkote, 12 months.
11th ,, ...	453	391	9	1	10	863·1	22·07	On march, ½ month; Muttra, 11½ months.
19th ,, Right Wing	226	263	1	1	3	1163·7	7·87	On march, ⅔ month; Benares, 11⅓ months.
19th ,, Left ,, ...	155	250	1			1612·9		Meerut, 1½ months; on march, 1 month; Cawnpore, 9½ months.
20th ,, ...	428	370	6	..	6	864·5	14·02	Campbellpore, Sydun Bowlie, 9½ months; Rawul Pindee, 2½ months.
21st ,, ...	341	398	4	..	4	1167·2	11·73	Umballa, 12 months.
Total Cavalry	2,886	3,401	52	4	56	1178·4	19·40	
ROYAL HORSE ARTILLERY.								
A Brigade	670	984	9	..	9	1468·9	13·43	A Battery, Meerut, 12 months. B ,, Meean-Meer, 1½ months; on march, 1 month; Peshawur, 9½ month. C ,, Lucknow, 12 months. D ,, Meerut, 12 months. E ,, Umballa, 1¼ months; on march, 1¾ months; Peshawur, 9 months.
C ,, ...	135	249	4	..	4	1844·5	29·63	F ,, Benares, 12 months.
F ,, ...	778	1,404	11	..	11	1804·6	14·14	A ,, Umballa, 12 months. B ,, Sealkote, 12 months. C ,, Morar, 10 months; on march, 1¼; Seepree, ¾ month. D ,, Rawul Pindee, 9⅓ months; on field service, 2⅔ months. E ,, Peshawur, 1½ months; on march, 1½ months; Umballa, 9 months. F ,, Peshawur, 1⅔ months; on march, 1 month: Meean-Meer, 9⅓ months.

Corps.	Average Strength for the Year.	Admitted into Hospital.	Died.			Annual Ratio per 1,000.		Stations during the Year.
			In India.	Of Invalids.	Total.	Admitted.	Died.	
ROYAL ARTILLERY.								
8th Brigade, ...	977	1,426	42	3	45	1459·6	46·06	B Battery, Lucknow, 12 months. C ,, Morar, 12 month. D ,, Bareilly, 12 months. E ,, Arrived from England, 16th January; on march, 2 months; Fyzabad, 9 months. F ,, Arrived from England, 16th January; on march, 1½ months; Seetapore, 9 months. G ,, Arrived from England, 16th January; on march, 1⅝ months; Cawnpore, 8⅝ months. H ,, Arrived from England, 16th January; on march, 1 month; Agra, 9⅓ months.
16th ,, ...	935	1,513	29	7	36	1618·2	38·50	A ,, Hazareebaugh, 12 months. B ,, Meerut, 12 months. C ,, Barrackpore, 12 months. D ,, Barrackpore, 12 months. E ,, Saugor, 12 months. F ,, Dinapore, 12 months. G ,, Jubbulpore, 12 months.
19th ,, ...	918	1,215	20	..	20	1323·5	21·79	A ,, Jhansi, 12 months. B ,, Rawul Pindee, 1 month; on march, ½ month; Peshawur, 10½ months. C ,, Meerut, 12 months. D ,, Mooltan, 12 months. E ,, Peshawur, 3⅓ months; on march, ⅓ month; Rawul Pindee, 5⅔ months; on field service, 2⅔ months. F ,, Meean-Meer, 12 months. G ,, Jullundur, 12 months.

Corps.	Average Strength for the Year.	Admitted into Hospital.	Died.			Annual Ratio per 1,000.		Stations during the Year.
			In India.	Of Invalids.	Total.	Admitted.	Died.	
Royal Artillery—*cont.*								
22nd Brigade	582	1,182	18	1	19	2030·9	32·65	A Battery, Allahabad, 12 months. B ,, On the march, 1 month; Ferozepore, 11 months. No. 3 Battery, Lucknow, 10½ months; Calcutta, 1½ months. No. 4 ,, Peshawur, 12 months. No. 5 ,, Morar, 11½ months; on march, ½ month. No. 6 ,, Meean-Meer, 9⅔ months; on march, 2⅓ months. No. 7 ,, Agra, 12 months.
24th ,, ...	400	429	5	..	5	1072·5	12·50	No. 1 Battery, Mooltan, 12 months. No. 2 ,, Meean-Meer, 8½ months; on field service, 3½ months. No. 3 ,, Meerut, 12 months. No. 4 ,, Allahabad, 12 months. No. 5 ,, Morar, 12 months. No. 6 ,, Umritsir, 10½ months; Meean-Meer, 1½ months.
25th ,, ...	260	485	5	..	5	1865·4	19·23	No. 1 Battery, Saugor, 1⅔ months; Darjeeling, 10⅓ months. No. 2 ,, Delhi, 12 months. No. 3 ,, Calcutta, 10⅔ months; on march, ⅓ month; Morar, 1 month. No. 4 ,, Attock, 12 months. No. 5 ,, On march, 1 month.
Total Royal Artillery	5,655	8,887	143	11	154	1571·8	27·24	

Corps.	Average Strength for the Year.	Admitted into Hospital.	Died.			Annual Ratio per 1,000.		Stations during the Year.
			In India.	Of Invalids.	Total.	Admitted.	Died.	
INFANTRY.								
1st Battalion 3rd Foot..	762	729	15	..	15	956·7	19·68	Meerut, 12 months; detachment at Dugshai, 2 months.
1st „ 5th „	818	936	11	..	11	1144·3	13·45	Ferozepore, 12 months; detachments at Kangra, 12 months; and Phillour, 3⅔ months.
1st „ 6th „	761	1,184	19	..	19	1555·8	24·97	On march, 2 months; Rawul Pindee, 6½ months; on field service, 3 months.
1st „ 7th „	768	1,161	26	1	27	1511·7	35·16	Saugor, 12 months.
1st „ 11th „	799	752	11	1	12	941·2	15·02	Fyzabad, 12 months.
2nd „ 12th „	806	932	18	3	21	1153·5	25·99	Jubbulpore, 12 months; detachments at Nagode, 1½ months, and Nowgong, 10½ months.
1st „ 14th „	98	79	3	..	3	806·1	30·61	Arrived from Malta; on march, 1 month; Cawnpore, ⅔ month.
1st „ 19th „	804	703	13	..	13	874·4	16·17	Nowshera, 1 month; Rawul Pindee, 8 months; on field service, 3 months.
2nd „ 25th „ Hd.-Qrs., and Left Wing	498	588	11	..	11	1180·7	22·09	Arrived from Ceylon; Calcutta, 2 months; on march, ⅔ month; Shajehanpore, 7⅓ months; Bareilly, 1½ months.
Do. „ „ „ Right Wing ..	282	829	18	..	18	2939·7	63·83	Berhampore, 9 months; on march, 1 month.
26th Regiment	387	796	9	..	9	2056·8	23·26	Arrived from Abyssinia and Bombay; Calcutta, 6 months.
35th „ Detachment	9	12	..	1	1	1333·3	111·10	Dera Ismael Khan, ½ month; on march, ½ month; Mooltan, 1 month; embarked for England.
36th „	727	1,392	11	1	12	1914·7	16·51	On march, ⅔ month; Peshawur, 11⅓ months.
37th „	747	547	9	1	10	732·3	13·39	Bareilly, 10⅔ months; Shahjehanpore, 1⅓ months.
Do. „ Left Wing	37	39	..	..	..	1054·1	..	Moradabad, 1⅓ months.
38th „	900	1,364	10	1	11	1515·6	12·22	Sealkote, 8⅓ months; on field service, 3⅔ months; with working parties.
41st „	847	809	8	2	10	955·1	11·81	Agra, 12 months.
55th „	877	1,004	12	5	17	1144·8	19·38	Lucknow, 12 months.
58th „ H. Q. Wing	403	352	1	3	13	873·4	18·41	Senchal, 11 months; on march, 1 month.
Do. „ Left Wing	303	475	9			1567·7		Benares, 12 months.

Corps.	Average Strength during the Year.	Admitted into Hospital.	Died.			Annual Ratio per 1,000.		Stations during the Year.
			In India.	Of Invalids.	Total.	Admitted.	Died.	
2nd Battalion 60th Regiment	806	1,087	21	..	21	1348·7	26·07	Calcutta, 11 months; on march, 1 month.
77th Regiment	752	1,169	6	1	7	1554·5	9·31	Peshawur, 1 month; Nowshera, 10½ months; on march, ½ month.
79th ,, H. Q., and Right Wing ..	343	323	9	2	13	941·7	18·57	Roorkee, 12 months.
Do. ,, Left Wing	357	711	2			1991·6		Delhi, 12 months.
85th ,, ...	633	1,510	22	..	22	2385·5	34·75	Arrived from England; on march, 1 month; Meean-Meer, with detachment at Lahore, 9 months.
88th ,, ...	737	1,177	10	2	12	1597·0	16·28	Peshawur, 11½ months; Nowshera, ½ month.
90th ,, ...	645	507	10	3	13	786·0	20·15	Subathoo, 10⅔ months; on march, 1⅓ months.
91st ,, ...	23	19	1	..	1	826·1	43·47	On march, ⅓ month, to Madras.
92nd ,, ...	783	1,469	31	..	31	1876·1	39·59	Arrived from England; on march, 1 month; Jullundur, 9 months.
93rd ,, ...	702	1,350	9	2	11	1923·1	15·67	Jhansi, 12 months; detachment at Seepree.
101st ,, ...	716	766	10	6	16	1069·8	22·35	Cawnpore, with detachment at Futtyghur, 10⅔ months; on march, 1⅓ months.
102nd ,, ...	751	856	25	2	27	1139·8	35·95	Arrived from Madras; Lucknow, 10 months.
103rd ,, ...	771	1,040	11	2	13	1348·9	16·86	Morar, 12 months; detachment at Fort Gwalior.
104th ,, ...	835	541	13	..	13	647·9	15·57	Dugshai, 9½ months; on march, 2 months; Peshawur, ½ month.
105th ,, ...	796	1,225	18	2	20	1539·0	25·13	Dinapore, 11⅔ months; Meerut, ⅓ month.
106th ,, ...	765	1,195	13	3	16	1562·1	20·91	Meean-Meer, 3 months; on march, ½ month; Umballa, 8½ months.
107th ,, ...	802	1,564	26	1	27	1950·1	33·67	Allahabad, 12 months.
109th ,, ...	706	930	12	..	12	1317·3	17·00	Mooltan, 12 months; detachment at Dera Ismael Khan.
3rd Battalion Rifle Brigade, H.Q. ..	538	546	7	..	7	1014·9	13·01	Rawul Pindee, ⅓ month; on march, 2⅔ months; Seetapore, with detachment at Moradabad, 9 months.
3rd ,, ,, Left Wing ..	271	239	5	..	5	881·9	18·45	Moradabad, 8½ months; on march, ½ month; Dinapore, ½ month.
Total Infantry	24,367	32,907	475	45	520	1350·5	21·34	

Compared with the results for 1867 this table shows a very slight increase in the proportion of admissions and deaths in the Cavalry, and a slight decrease in the admissions but a very marked one in the deaths in both Artillery and Infantry. The great reduction in the death rate was doubtless due to the absence of cholera as an epidemic. The Table however still shows the same results as to the relative sickness and mortality in the different arms, the ratio of both being lowest in Cavalry and highest in Artillery. *Bengal.*

In the Cavalry the admissions were lowest in the 11th Hussars at Muttra, and the 20th at Campbellpore, and the deaths in the 19th Hussars at Benares and Cawnpore. The admissions were highest in the 4th Hussars at Meerut, chiefly from fevers, diarrhœa, bronchitis, and abscesses and ulcers, and the deaths in the 5th Lancers at Lucknow. The highest ratio of admissions in the Command occurred in the right wing of the 2nd Battalion 25th Regiment at Berhampore, the next to it in the 85th Regiment at Meean Meer, and the next in the 26th Regiment at Fort William; but none of these corps were in Bengal during the whole of the year, the 25th Regiment having arrived at Calcutta from Ceylon on the 22nd of January, the 26th from Abyssinia, by Bombay, in June and July, and the 85th at Kurrachee from England on the 11th of March. Of those infantry corps which were in the Command during the whole year, the 107th at Allahabad had the highest ratio of admissions and the 1st Battalion 7th Regiment at Saugor of deaths.

SANITARY REPORT.

Staff Assistant-Surgeon Dr. Sutherland, makes the following remarks in the Report accompanying the Sanitary Return of British troops serving in the Bengal Command:—

Regarding the meteorological conditions of the year, suffice it to state that the months of January, February, and March were seasonable. In the following month, however, there was a great elevation of temperature, and as this continued until the end of September, with an unusually dry season in the North-West Provinces and Punjab, serious fears were at one time entertained that there would be a great scarcity of grain and probably a famine; these disastrous results were happily averted by a timely fall of rain.

The subjoined Table exhibits the admissions and deaths from insolatio and apoplexy during the years 1867 and 1868:—

Years.	Admissions from Apoplexy and Insolatio.	Deaths from Apoplexy and Insolatio.	Ratio per 1,000 of Strength to Deaths from Apoplexy and Insolatio.
1867	214	86	2·51
1868*	285	102	3·13

The 1st Battalion 6th, and 38th Regiments when *en route* for the Hazara country suffered very severely from exposure to the sun; these two regiments have furnished nearly one-third of all admissions during the year.

Cholera.—The troops during the year have been particularly fortunate in not having had cholera amongst them in an epidemic form, as was the case during the previous year.

On the occurrence of the disease at Jubblepore amongst the 2nd Battalion 12th Regiment, the married people and men of one company were moved into camp, and the further progress of the disease was arrested. Cholera also occurred at Chinsurah in the months of April, May, and June; its appearance on each occasion being preceded by a heavy fall of rain. The barracks, on the occurrence of each outbreak, were vacated, and the men were encamped on the parade ground. Cases of cholera also occurred amongst the men of the

* An admission has been entered for all deaths out of hospital; such also was done in the deaths out of hospital during the previous year.

Bengal. Right Wing of the 2nd Battalion 25th Regiment at Berhampore, but it was not considered necessary to move them into camp.

Venereal Diseases.—The continued and progressive decrease which has taken place in the admission rates from venereal diseases since the introduction of Lock Hospitals and other sanitary measures for their repression, is on the whole satisfactory.

The results which have already accrued are a sufficient guarantee that the measures adopted have been wise and judicious, and if carried out to their full extent will probably be found to be powerful in arresting one of the chief causes of physical degeneracy in the British Army.

Defects in the construction, ventilation, &c., of barracks and hospitals that have been referred to by Medical Officers in the Reports of previous years, continue to be the subject of remark by them. Notwithstanding that great energy has been displayed during the year in endeavouring to effect improvements of a sanitary nature, much yet requires to be done, according to the statements contained in the Sanitary Reports received from Medical Officers. The new double-storied barracks which are being built at certain stations, which must be held for political and military purposes notwithstanding their unhealthiness, are a great improvement on the buildings formerly occupied by the troops. There can be very little doubt that the greater the number of European troops that can be located in the hills the greater will be the improvement effected in the health and efficiency of the whole force.

The following improvements were among the more important that have been carried out. Besides these, a considerable number of minor alterations and improvements have been effected.

Head-Quarters C Battery, 16th Brigade, Royal Artillery, Barrackpore.—Double storied buildings are in course of erection.

22nd Brigade, Royal Artillery, Morar.—The raised double-storied barracks are approaching completion.

14th Brigade, Royal Artillery, Mooltan.—New barracks are approaching completion.

21st Hussars, Umballa.—The roofs of the barracks have been raised and upper ventilators introduced.

1st Battalion, 5th Fusiliers, Ferozepore.—New married quarters are almost completed, and are already in occupation.

10th Battalion, 7th Regiment, at Saugor.—The new barracks (of which four are in occupation) are in every way excellent, and the rooms are well lighted and ventilated.

The barracks for the 2nd Battalion, 12th Regiment, at Nowgong, will soon be completed.

92nd Regiment, Julluuder.—New barracks are in course of erection, and some of them will soon be occupied.

103rd Regiment, Fortress Gwalior.—New double-storied barracks and three new blocks of married quarters nearly finished; a double-storied barrack for a battery of Artillery, nearly completed; one block of staff serjeants' quarters for three families finished.

107th Regiment, Allahabad.—The barrack buildings will soon be completed.

109th Regiment, Mooltan.—New barracks on the standard plan are being erected; married quarters are in course of erection.

3rd Battalion, Rifle Brigade, Seetapore.—New double-storied barracks for the accommodation of a "wing" of a regiment are being completed.

Convalescent Depôt, Kussowlie.—Two double-storied barracks are in progress, and one will be soon ready for occupation.

Convalescent Depôt, Landour.—Buildings are being erected at Chuckrata, where the depôt is to be transferred.

Convalescent Depôt, Nynee Tal.—New barracks upon the standard plan are in the course of erection at Ranee Khet, where the depôt is to be transferred.

The defective drainage which exists at certain stations must not only be a source of discomfort to the men but also a cause of sickness, as in certain instances the water lodges and becomes a regular cesspool. At some of the barracks at Peshawur, Delhi, Berhampore, Dum Dum, Rorkee, and Lucknow, the surface drainage is a source of complaint.

II. MADRAS.

STATISTICAL REPORT.

The average strength of the European troops in the Madras Command during 1868 was 10,158; the admissions into hospital were 14,214, and the deaths 241, of which 208 occurred in the Command, and 33 among the invalids sent to England. These numbers give the proportions of 1,399 admissions and 23·72 deaths per 1,000 of mean strength; both a little higher than the results in the preceding year. *Madras.*

The influence of the different classes of diseases in causing this amount of sickness and mortality is shown in the following Table, framed from Abstract No. 25 in the Appendix:—

Orders.	Diseases.	Strength, 10,158.				Ratio per 1,000 of Mean Strength.			
			Deaths.			1868.		1860–67.	
		Admitted.	In the Command.	Of Invalids.	Total.	Admitted.	Died.	Admitted.	Died.
	Class I.								
1	Miasmatic Diseases ..	4,788	46	9	55	471·3	5·41	553·3	8·85
2	Enthetic „ ..	2,626	1	2	3	258·5	·29	252·3	·36
3	Dietic „ ..	598	5	..	5	58·9	·49	21·4	·17
4	Parasitic „ ..	83	..	..	..	8·2	..	12·6	..
	Class II.								
1	Diathetic Diseases ..	84	3	..	3	8·3	·29	6·5	·22
2	Tubercular „ ..	125	9	8	17	12·3	1·67	16·9	2·23
	Class III. Diseases of the—								
1	Nervous System ..	483	26	..	26	47·5	2·56	36·6	1·54
2	Circulatory „ ..	126	12	..	12	12·4	1·18	17·2	1·31
3	Respiratory „ ..	471	4	4	8	46·4	·79	52·7	·63
4	Digestive „ ..	1,682	67	6	73	165·6	7·19	148·0	3·96
5	Urinary „ ..	31	2	..	2	3·0	·20	3·2	·17
6	Reproductive „ ..	157	..	..	..	15·5	..	17·3	..
7	Locomotive „ ..	64	..	..	..	6·3	..	4·9	·03
8	Integumentary „ ..	1,306	..	..	..	128·6	..	125·0	·08
	Class IV.								
4	Diseases of Nutrition..	230	..	..	..	22·6	..	10·6	·17
	Class V.								
1	Accidents	1,324	27	2	29	130·3	2·86	110·6	1·85
4	Suicide	1	6	2	8	·1	·79	..	·30
6	Corporal punishment..	..	..	..	..	..	..	2·4	..
	No appreciable Disease	1	..	..	..	·1	..	·5	..
	Diseases not specified..	34	..	..	..	3·3	..	3·1	·14
	Total	14,214	208	33	241	1399·3	23·72	1395·1	22·01

The admissions and deaths have been very slightly above the average of the preceding eight years, but there has been a considerable difference in some of the classes of diseases, there having been a marked decrease in miasmatic, and increase in dietic diseases and those of the nervous and digestive systems, and in accidents.

Madras. MIASMATIC DISEASES furnished 82 admissions and 3·44 deaths per 1,000 of the strength less than the average of the eight preceding years. Compared with the results of 1867 there was as great a reduction in the admissions but a decrease of only ·24 per 1,000 in the deaths. When subdivided they give the following results:—

Diseases.	Admitted.	Died.	Ratio per 1,000 of Mean Strength. 1868. Admitted.	1868. Died.	1860–67. Admitted.	1860–67. Died.
Eruptive Fevers..	19	1	1·9	·10	·9	·08
Paroxysmal „	1,457	5	143·4	·49	166·7	·70
Continued „	471	9	46·4	·89	78·3	1·23
Dysentery and Diarrhœa	1,634	23	160·9	2·26	174·5	3·07
Spasmodic Cholera..	10	7	1·0	·69	5·6	2·76
Sorethroat and Influenza	178	..	17·5	..	16·7	..
Ophthalmia..	351	..	34·5	..	34·4	..
Rheumatism.	465	..	45·8	..	61·5	·04

Eruptive Fevers were above the average, from the occurrence of nine cases of smallpox, of which one died, at Kamptee, where the disease was at the time prevalent among the native population.

Paroxysmal and Continued Fevers were considerably below the average, and there was a decrease also in *dysentery and diarrhœa.*

Spasmodic Cholera did not prevail as an epidemic during the year, and although the ratio of admissions and deaths was slightly higher than in 1867, it was still much under the average of the last eight years.

Sorethroat and Influenza and *Ophthalmia* closely approximated the average, but the latter showed an increase upon the proportion of the preceding year.

Rheumatism was a little less prevalent than in 1867, and about a fourth under the average of the last eight years.

ENTHETIC DISEASES were considerably more prevalent than in 1867, and also slightly above the previous average. The increase took place entirely in the syphilitic group.

DIETIC DISEASES show a very marked increase even upon the high results for 1867. The principal, indeed almost the only disease returned, being intemperance (*ebriositas*), under which 591 cases and 5 deaths are recorded. If to these deaths are added 5 by *delirium tremens*, a rate of mortality from the *direct* effects of intemperance is shown amounting to very nearly one in every 1,000 of the strength. The proportion of admissions by these two diseases was greatly in excess in the 45th Regiment, which returned from service in Abyssinia, and in which it amounted to 22 per cent. of the mean strength, in the 23rd Brigade Royal Artillery, in which it was 11½; the 2nd Battalion 21st Regiment 11, and the D Brigade Royal Horse Artillery 10½ per cent. The 5th and 14th Brigades Royal Artillery also furnished a high ratio of admissions.

PARASITIC DISEASES were one-third under the average. The decrease took place in cases of itch and of Guinea worm. Only two cases of tape worm occurred in the 45th Regiment after its return from Abyssinia, where that disease was believed to be endemic.

DISEASES OF THE NERVOUS SYSTEM were also one-third above the average, but chiefly owing to an increase in the cases reported under the somewhat unsatisfactory title of headache (*cephalœa*), and of inflammation of the ear. Of the former the 76th, 10th, and 24th Regiments, and the 20th Brigade Royal Artillery, furnished much the largest proportion.

DISEASES OF THE CIRCULATORY SYSTEM continue to show a decrease. This has been chiefly in the cases reported as inflammation of the heart (carditis),

to which we drew special attention in the last two Reports, and in valve disease of the heart; it is in the latter disease that the reduction in the mortality has taken place.

DISEASES OF THE DIGESTIVE SYSTEM furnished exactly the same proportion of admissions as in 1867, but that of the deaths was considerably higher. Of the 73 deaths recorded in this class 68 were caused by inflammation of the liver, in many instances ending in abscess; 64 of them occurred in India, and 4 among the invalids. They were the cause of upwards of one-fourth of the total mortality of the year.

ACCIDENTS AND VIOLENCE were above the average both of admissions and deaths; the increase of the latter was due to heat apoplexy, the deaths by which were exactly double the preceding year. There were eight suicidal deaths: one by fire-arms, one by hanging, two by cut throat, and four by drowning, two of the latter being invalids on their passage home.

The following Table shows the sickness and mortality at the different stations in the Command during the year:—

Stations.		Average Annual Strength.	Admitted into Hospital.	Died in India.	Ratio per 1,000 of Strength.			
					Admitted.	Died.	Average of previous Period.	
							Admitted.	Died.
Sea Coast..	Fort St. George and St. Thomas's Mount ..	1,107	1,873	18	1692·0	16·26	1714·5	20·52*
	Cannanore ..	715	869	13	1215·4	18·18	1174·2	11·55*
	Calicut	76	69	2	907·9	26·32	848·1	16·86†
	Palaveram ..	52	38	2	730·8	38·46	829·9	12·14‡
Plains ..	Trichinopoly ..	219	313	1	1429·2	4·57	1466·2	17·47†
	Malleapooram ..	77	81	3	1051·9	38·97	1080·5	18·72†
Table Lands	Bangalore ..	1,671	1,946	24	1164·6	14·36	997·4	14·54*
	Bellary	595	670	6	1126·1	10·98	1056·2	11·99*
	Secunderabad ..	2,316	3,117	67	1345·9	28·93	1549·3	22·07*
	Kamptee	1,035	1,598	17	1544·0	16·42	1654·0	18·98*
	Seetabuldee ..	35	50	..	1428·6	..	1141·2	18·04*
Hill Station..	Wellington . ..	261	377	3	1444·5	11·49	1202·3	14·33*
Birmah ..	Rangoon	712	1,209	7	1698·0	9·83	1290·3	14·16*
	Tonghoo	348	407	9	1169·5	25·86	1358·9	26·95†
	Thayetmyo ..	544	830	8	1525·7	14·71	1729·9	12·86§
	Port Blair ..	113	146	3	1292·0	26·25	1515·7	11·57*
Depôts ..	Poonamallee ..	125	371	7	2921·3	55·12	1650·5	22·12‡
	Chindwarrah ..	24	41	1	1708·3	41·67	2475·5	77·55†
	Ramandroog ..	34	32	..	941·2	..	1976·5	25·31‡
Troops on the March		81	169	15	..	..	2214·9	52·63†
Invalids in Bombay		..	..	2	..	..	..	..

* 1860–7 (exclusive of 1862). † 1863–7. ‡ 1864–7. § 1865–7.

If the depôts are omitted, the admissions were not greatly above the average at any of the stations; Rangoon and Fort St. George furnished the highest ratios. At some of the small stations the ratio of mortality appears very high, but this is simply a result of the small numbers under observation. Of the large stations, Secunderabad and Tonghoo had a very high proportion of deaths. The number of deaths among troops on the march was large, but unfortunately, from defects in the Returns, it has been found impossible to give a correct average strength, or to state the number of the admissions which occurred among them. Of the 15 deaths in this group 8 occurred in the 21st Regiment.

The following Table shows the admissions and deaths by classes of diseases at each of the groups of stations in the Command:—

Madras.

Order.	Diseases.	Stations on Sea Coast.		Stations on Plains.		Stations on Table Lands.		Hill Station.		Birmah.		Depôts.		Troops on the March.	Stations on Sea Coast.		Stations on Plains.		Stations on Table Lands.		Hill Station.		Birmah.		Depôts.	
	Average Strength	1,950		296		5,652		261		1,717		185			Annual Ratio per 1,000 of Strength.											
		Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
	Class I.																									
1	Miasmatic Diseases ...	824	4	101	1	2750	26	129	...	768	6	120	2	7	422·6	2·05	341·2	3·38	486·5	4·60	494·2	...	447·3	3·50	648·6	10·81
2	Enthetic ,, ...	570	...	87	...	1251	...	62	...	618	...	123	...	1	292·3	...	293·9	...	221·3	...	237·6	...	359·9	...	664·9	...
3	Dietic ,, ...	170	1	13	...	351	2	3	...	51	1	8	...	1	87·2	·51	43·9	...	62·1	·35	11·5	...	29·7	·58	43·2	...
4	Parasitic ,, ...	27	...	3	...	32	...	3	...	17	...	1	...	...	13·8	...	10·1	...	5·7	...	11·5	...	9·9	...	5·4	...
	Class II.																									
1	Diathetic Diseases ...	20	...	1	...	47	1	2	...	10	...	1	2	...	10·2	...	3·4	...	8·3	·18	7·7	...	5·8	...	5·4	10·81
2	Tubercular ,, ...	22	1	3	...	57	5	2	...	23	1	16	...	1	11·3	·51	10·1	...	10·1	·88	7·7	...	13·4	·58	86·5	...
	Class III. Diseases of the—																									
1	Nervous System ...	129	8	13	1	206	12	13	...	93	4	21	...	...	66·1	4·10	43·9	3·38	36·5	2·12	49·8	...	54·1	2·33	113·5	...
2	Circulatory ,, ...	26	1	4	...	65	9	5	2	15	...	10	1	...	13·3	·51	13·5	...	11·5	1·59	19·1	7·67	8·7	...	54·1	5·40
3	Respiratory ,, ...	145	2	11	...	195	2	21	...	77	...	15	...	...	74·4	1·03	37·2	...	34·5	·36	80·5	...	44·9	...	81·1	...
4	Digestive ,, ...	271	9	38	...	971	48	57	1	271	6	60	...	2	139·0	4·62	128·4	...	171·8	8·49	218·4	3·83	157·8	3·50	324·3	...
5	Urinary ,, ...	10	...	...	...	15	1	2	...	3	1	1	...	...	5·1	...	...	...	2·6	·18	7·7	...	1·8	·58	5·4	...
6	Reproductive ,, ...	29	...	3	...	75	...	10	...	31	...	10	...	...	14·9	...	10·1	...	13·3	...	38·3	...	18·1	...	54·1	...
7	Locomotive ,, ...	21	...	3	...	33	...	1	...	5	...	1	...	...	10·8	...	10·1	...	5·8	...	3·8	...	2·9	...	5·4	...
8	Integumentary ,, ...	259	...	49	...	545	...	25	...	284	...	20	...	...	132·8	...	165·6	...	96·4	...	95·8	...	165·4	...	108·1	...
	Class IV.																									
4	Diseases of Nutrition ...	57	...	9	...	53	...	15	...	77	...	19	...	...	29·2	...	30·4	...	9·4	...	57·5	...	44·9	...	102·7	...
	Class V.																									
1	Accidents	254	8	56	2	716	7	27	...	248	7	17	2	3	130·3	4·10	189·2	6·75	126·7	1·24	103·4	...	144·4	4·07	91·9	10·81
4	Suicide	...	1	...	...	...	1	...	...	...	1	1	1	...	...	·51	...	...	...	·18	...	...	...	·58	5·4	5·40
	Not yet diagnosed ...	15	...	...	...	18	...	...	...	1	...	...	...	...	7·7	...	...	...	3·2	...	...	...	·6	...	...	...
	No appreciable disease ...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	·2	...	...	...	...	...	...	...
	Total	2849	35	394	4	7381	114	377	3	2592	27	444	8	15	1461·0	17·94	1331·0	13·51	1305·9	20·17	1444·5	11·50	1509·6	15·72	2400·0	43·24

The ratio of admissions has not varied very materially from that of the preceding year at any of the groups except the Hill Station and the Depôts, at the former of which there has been a great increase and at the latter a considerable decrease. At the stations on the Plains the mortality, though much higher than in 1867, was under the average; excepting the Depôts, the stations on the Table Lands furnished the highest proportion of deaths. *Madras.*

MIASMATIC DISEASES, have been less prevalent than in 1867 at all the groups except the Hill Station, where there is a marked increase. The following Table shows the influence of the principal diseases of this class at each group of stations:—

Madras.

Diseases.	Stations on Sea Coast.		Stations on Plains.		Stations on Table Lands.		Hill Station.		Birmah.		Depôts.		Troops on the March.	Stations on Sea Coast.		Stations on Plains.		Stations on Table Lands.		Hill Station.		Birmah.		Depôts.	
	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Average Strength	1,950		296		5,652		261		1,717		185			Annual Ratio per 1,000 of Mean Strength.										
Eruptive Fevers	1	...	1	...	16	1	...	...	1	...	...	...	...	·5	...	3·4	...	2·8	·18	...	...	·6	...	...	...
Paroxysmal ,, ...	140	...	42	...	943	2	61	...	184	1	84	1	1	71·8	...	141·9	...	168·8	35	203·7	...	105·4	·58	183·7	5·41
Continued ,, ...	158	1	3	...	213	6	2	...	83	2	...	...	...	81·0	·51	10·1	...	37·7	1·06	7·6	...	48·3	1·16	48·7	...
Dysentery and Diarrhœa	271	3	26	1	963	13	33	...	245	1	60	1	3	139·0	1·54	87·8	3·38	171·3	2·30	126·4	...	142·7	·58	324·3	5·41
Spasmodic Cholera	...	...	...	...	6	4	...	...	1	1	...	...	2	...	...	...	...	1·1	·71	...	...	·6	·58	...	...
Sorethroat and Influenza	30	...	1	...	95	...	3	...	46	...	3	...	...	15·4	...	3·4	...	16·8	...	11·5	...	26·8	...	16·2	...
Opithalmia	59	...	7	...	215	...	12	...	52	...	5	...	...	30·3	...	23·6	...	38·0	...	46·0	...	30·3	...	27·0	...
Rheumatism	94	...	10	...	202	...	18	...	127	...	9	...	...	48·2	...	33·8	...	35·7	...	69·0	...	74·0	...	48·7	...

Paroxysmal Fevers were less prevalent than in the preceding year at all the groups except the Hill Station and the Stations in the Plains, at the former of which there was a very marked, and at the latter a trifling increase. At Wellington, the increase was due to the nature of the cases sent there for change, the Medical Officer in charge stating that they were nearly all relapses of fever contracted in the plains; at Trichinopoly it was attributed to the previous service of the men at Kamptee, where they had acquired a liability to ague. The reduction in the amount of these fevers at the stations on the Table Lands occurred chiefly at Bellary and Kamptee, at the latter of which they amounted to 424 per 1,000 of the strength, while they were as high as 798 in the preceding year. Paroxysmal fevers were very much less prevalent in Birmah than in 1867; the decrease was most marked at Port Blair and Tonghoo. *Madras.*

Continued Fevers were very much less prevalent at all the groups except the Depôts and the Stations on the Plains; and at the latter, although the proportion was higher than in the preceding year it amounted only to 1 per cent. of the strength.

Dysentery and Diarrhœa show a decrease at all the groups except at the Hill Station, where in 1867 the ratio was much under the average, and in Birmah. In the latter they were less prevalent at Tonghoo than at any of the other stations.

Spasmodic Cholera did not prevail as an epidemic during the year. Only 10 cases and 7 deaths occurred throughout the whole Command; of these, 6 cases and 4 deaths took place at Kamptee in the end of June and beginning of July, one at Thayetmyo on the 1st of January, and three cases with two deaths in the 2nd Battalion 21st Regiment in the vicinity of Hyderabad while on the march from Secunderabad to embark for Birmah. At Kamptee there was cholera during May and June among the civil population and the Native Infantry; in the end of June a case occurred in the 91st Regiment which terminated fatally, and in the beginning of July two fatal cases occurred in the Artillery, and three more cases, of which two recovered, in the 91st Regiment. The disease then ceased.

Ophthalmia was more prevalent in 1867 at all the groups of stations except those on the Plains and the Depôts, at the former of which there was a reduction, and at the latter the proportion was identical in the two years. They were most prevalent at the Stations on the Table Lands, and particularly Bellary and Bangalore, but not to such an extent in any corps as to call for special remark.

ENTHETIC DISEASES were less prevalent at the Stations on the Sea-coast and the Plains, but there was an increase at all the other groups of stations, but particularly in Birmah and at the Depôts. At the latter this was due to the number of cases of secondary syphilis sent from other stations, particularly to Poonamallee. The excess in Birmah occurred chiefly at Rangoon, and particularly in the 24th Regiment, in which the admissions by diseases of this class amounted to 466 per 1,000 of the strength of the corps. There has been no lock hospital established as yet in Rangoon.

DIETIC DISEASES were much more prevalent than in the preceding years at all the groups of stations except the Depôts, where there was a slight decrease. Almost the only cases included under this group were the results of intemperance (*ebriositas*). The highest ratio of admissions was at the Sea-coast Stations, and next to them those on the Table Lands. In the first of these, Fort St. George furnished much the largest proportion, the admissions having amounted to 97, in an average strength of 679, and having occurred chiefly in the July-September quarter. Of the stations on the Table Lands, Bangalore was greatly in excess, having had 165 cases in an average strength of 1,671 men. In Fort St. George the excess was chiefly caused by the 45th Regiment, on its return from Abyssinia, the men having a large amount of money to spend, and the greater part of it being squandered in dissipation. At Bangalore, although the difference was not so marked as at Fort St. George, the highest proportion of cases was in the last quarter of the year, and the corps in which it was most marked were the A Battery D Brigade Royal Horse Artillery, the A Battery 14th Brigade Royal Artillery, and the 2nd Battalion 19th Regiment. The great prevalence of intemperance at the station was

Madras. attributed by the Medical Officers to the large sums of money passing into the hands of the men on re-engagement at the expiration of their first period of service. Surgeon Heffernan, 19th Regiment, states that "there has been an "unusual amount of intemperance in the corps during the last year, owing to "the increased sum of money that has been distributed to soldiers on re-engage-"ment; 147 men have re-engaged during the period, and 1,741*l.* have been "paid to them on this account. This system of bounty has a most demoraliz-"ing effect on the soldiers, in many instances ruining the constitution, destroy-"ing the morals, without conferring any benefit on the recipient, and most of "the fatal cases which have occurred during the year have been more or less "attributable to intemperance." Deputy Inspector-General Barclay, in commenting upon this fact, observes "It may safely be assumed that more than "1,700*l.* of that sum have been spent on drink, there being, it is generally "understood, an agreement or understanding, that bounty money is to be con-"sidered the property of the company to which the re-engaging men belong, "and to be so expended."

Diseases of the Nervous System were considerably more prevalent than in 1867 at the Stations on the Coast and in Birmah, but the excess was chiefly in cases of headache and inflammation of the ear (*otitis*); the mortality also was higher at both these groups and at the Stations on the Plains. Apoplexy was the cause of half the deaths by this class. *Delirium Tremens* gave rise to 69 admissions and 5 deaths in the Command. The stations at which it was most prevalent were Rangoon, Madras, Kamptee, Bangalore, and Secunderabad.

Diseases of the Digestive System continue an important source of sickness and mortality, chiefly from hepatic diseases, which caused nearly half the admissions and almost the whole of the mortality by this class. Secunderabad, Madras, and Kamptee were the stations at which they were most prevalent, and Secunderabad that at which they were most fatal.

Accidental and Violent Deaths were much higher than in the preceding year at the Stations on the Coast and on the Plains, in Birmah, and at the Depôts. The increase was in deaths by sunstroke and drowning, both of which were double the amount in the preceding year. Sunstroke was not epidemic in any of the corps, nor at any of the stations during the year.

The admissions and deaths in each corps during the year are shown in the following Table:—

Regiments.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Annual Ratio per 1,000.		Stations during the Year.
			In Madras.	Of Invalids.	Total.	Admitted.	Died.	
CAVALRY.								
16th Lancers	472	364	3	1	4	771·2	8·47	Bangalore, 12 months.
18th Hussars	404	534	17	1	18	1,321·8	44·55	Secunderabad, 12 months.
Total Cavalry	876	898	20	2	22	1,025·1	25·11	
ROYAL ARTILLERY.								
D Brigade R.H.A.	547	942	9	..	9	1,722·1	16·45	A Battery, Bangalore, 11 months; on the march, ½ month; Kamptee, ⅔ month. B ,, Bellary, 12 months. C ,, Kamptee, 12 months. D ,, Secunderabad, 12 months.
5th Brigade R.A.	271	430	6	2	8	1,586·7	29·52	No. 1 Battery, Rangoon, 12 months. No. 2 ,, Singapore, 1 month; *en route* to Madras, 1 month; St. Thomas's Mount, 10 months. No. 3 ,, Fort St. George and St. Thomas's Mount, 9 months; *en route* to Tonghoo, 1 month; Tonghoo, 2 months. No. 5 ,, arrived from Bombay. Rangoon, 1 month.
14th ,, ,, ...	378	623	10	..	10	1,648·2	26·45	A Battery, Bangalore, 12 months. B ,, Secunderabad, 12 months. C ,, Kamptee, 12 months.
20th ,, ,, ...	700	929	17	2	19	1,327·1	27·14	Hd.-Qrs. and F Battery, Kamptee, 12 months. No. 1 Battery, Fort St. George, 10⅔ months. Proceeded to Bombay. B ,, St. Thomas's Mount, 12 months. C ,, Thayetmyo, 1 month; on the march, 2 months; Secunderabad, 9 months. D ,, Cannanore, 12 months. No. 5 ,, Secunderabad, 12 months.

Regiments.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Annual Ratio per 1,000.		Stations during the Year.
			In Madras.	Of Invalids.	Total.	Admitted.	Died.	
ROYAL ARTILLERY—*cont.*								
23rd Brigade R. A.	696	969	7	2	9	1,392·2	12·93	A Battery, Bangalore, 1 month; *en route* to Thayetmyo, $\frac{2}{3}$ month; Thayetmyo, $10\frac{1}{3}$ months. B „ St. Thomas's Mount, 12 months. C „ Trichinopoly, 12 months. D „ Secunderabad, 1 month; Bangalore, 11 months. No. 5 „ Rangoon, 9 months; broken up on 30 September. No. 7 „ St. Thomas's Mount, $2\frac{1}{3}$ months; on the march, $\frac{1}{3}$ month; Bellary, $9\frac{1}{3}$ months.
Total Royal Artillery ..	2,592	3,893	49	6	55	1,501·9	21·21	
INFANTRY.								
1st Battalion 1st Foot	865	1,103	16	3	19	1,275·1	21·96	Cannanore, 12 months; Detachments at Calicut, Malleopooram, and Trichinopoly.
2nd „ 10th „	838	921	16	2	18	1,099·0	21·48	Bangalore, 1 month; Secunderabad, 11 months.
2nd „ 19th „	669	862	16	..	16	1,288·5	23·91	Thayetmyo, $1\frac{1}{3}$ months; *en route* to Bangalore, $\frac{2}{3}$ month; Bangalore, 10 months.
2nd „ 21st „	864	1,455	36	4	40	1,684·0	46·29	Secunderabad, $10\frac{1}{3}$ months; *en route* to Rangoon, $1\frac{1}{3}$ months. Detachments at Poona, Wellington, Madras, and Poonamallee, 12 months.
2nd „ 24th „	775	1,282	10	6	16	1,654·2	20·64	Rangoon, 12 months. Detachments at Port Blair, Andaman Isles, Wellington, Poonamallee, and Madras, 12 months.
45th Foot	361	556	5	..	5	1,540·2	13·85	Arrived from Abyssinia. Fort St. George, 6 months. Detachments at Wellington, and Palaveram.

Regiments.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Annual Ratio per 1,000.		Stations during the Year.
			In Madras.	Of Invalids.	Total.	Admitted.	Died.	
INFANTRY—*cont.*								
3rd Bn. 60th Foot, H.-Q. & Wing	454	731	10	3	17	1,610·1	22·22	Fort St. George, 6 months; Bangalore, 4½ months; on the march, ½ month; Bellary, 1 month. Detachments at Madras, Bangalore, Wellington, Poonamallee, Palaveram, and Ramandroog.
„ „ Detached „	320	333	4			1,040·6	..	Bellary, 11 months. Joined Head-Quarters.
76th Foot, H.-Q.	440	921	14	3	17	2,093·2	23·86	Bellary, ⅓ month; *en route* to Birmah; Thayetmyo, 10⅔ months.
„ Left Wing	275	239				869·0	..	Fort St. George, ⅔ month; *en route* to Birmah, 1 month; Tonghoo
91st „	560	751	8	2	10	1,341·1	17·85	Arrived from Bengal. Kamptee, 8⅓ months. Detachments at Seetabuldee and Chindwarrah. Embarked for England, 12th October.
102nd „	132	85	..	2	2	643·9	15·15	Kamptee, 1½ month. On the march, ½ month. Detachment at Seetabuldee. Proceeded to Bengal.
Total Infantry	6,553	9,239	135	25	160	1,409·9	24·41	

Madras.

The general results of the amount of sickness and mortality by arms of the Service correspond with those of the preceding year, the sickness having as then, been lowest in the Cavalry and highest in the Artillery, while the mortality was exactly the reverse. The two Cavalry regiments presented the same marked contrast—as regards the mortality, still more marked—of the low ratio of sickness and death in the 16th Lancers, and a high ratio in the [illegible]th Hussars, due doubtless to their having continued to occupy the same quarters, Bangalore and Secunderabad respectively. The diseases in which the difference was most striking were paroxysmal fevers, dysentery and diarrhœa, and hepatic affections.

The highest ratio of admissions in any corps was in the 76th Regiment, stationed during the greater part of the year at Thayetmyo and Tonghoo; in the Battery of Artillery at Thayetmyo the ratio was under the average.

The highest ratio of deaths was in the 2nd Battalion 21st Regiment, stationed for 10½ months at Secunderabad, and *en route* to Rangoon during the rest of the year. Of the 40 deaths in this corps 4 occurred among the invalids on their passage home and 7 on the march.

The ratio of admissions in the Infantry was lowest in the 2nd Battalion 10th Regiment, at Secunderabad, and of deaths in the 2nd Battalion 24th Regiment, at Rangoon, if we omit the 45th, 91st, and 102nd Regiments, which were in the Command during only a portion of the year.

SANITARY REPORT.

Barracks.

Inspector-General Hadaway, in his Annual Sanitary Report of the British forces serving in the Command, makes the following remarks:—

"*Depôt Poonamallee.*—All repairs or improvements to the buildings at this station were stopped in consequence of the contemplated removal of the invalid depôt to the new marine sanitarium at Ennore, 12 miles north of Madras; roof ventilation has been made to all the buildings during the past year, except a portion of the east-south-east face."

Mysore Circle.—There has been no considerable change during the year in the barracks occupied by the troops at any of the stations in the Mysore Circle, and such minor changes as there have been, will be best described when the individual corps come to be reported on. I may state in general terms that nowhere within the Circle has any approach been made, in the construction of barracks and hospitals, to the standard plans recommended by the Barrack and Hospital Commission, and that in several important particulars those plans appear to have been virtually set aside.

Most of the barracks and hospitals in the Circle had indeed been built long before the suggestions of the Commission were published, but this is not the case as to the majority of the barrack buildings on the Race Course at Bangalore, or the new Artillery barracks and hospitals at Cannanore, and the new hospitals on the Race Course here, are still in the contractor's hands.

In no instance has any new building been constructed on arches; as a general rule, the plan has included no means of drainage around the exterior of the walls to keep the foundation dry (the Race Course Barracks are without such drains to this day); in no instance has the subsoil drainage of a site to be built on been carried out; and in every instance that I am acquainted with, the floors have been constructed of roughly cut slabs of stone, so imperfectly cemented together that they could not be washed without saturating the soil beneath with dirty water. This I think is much to be regretted. The necessity for the floors being made absolutely impervious to water has been frequently pointed out, but those most recently constructed, viz., the lower floors of the new hospitals on the Race Course at Bangalore, not yet given over, are as bad as any that I have seen.

The above remarks of course do not apply to the upper floors of the new hospitals, which, at my suggestion, have been covered with asphalte instead of chunam, as originally ordered. These hospitals are the only two-storied public buildings in the Circle.

In the new Artillery barracks at Cannanore, the sleeping rooms are at

either end, but in all the barracks here, and in those for the Infantry at Bellary, the sleeping room is in the centre of each block, and on either side there is an enclosed verandah, and beyond it an open verandah. This plan, I consider for several reasons, objectionable. One of the inner verandahs is intended for use as a dining room, and the other as a day room, but I have invariably seen one at least of these verandahs used as a dormitory. One block of barracks is wanted for some other purpose—as a theatre it may be, or a band-room, or a serjeant's mess, and the men are crowded into the remainder, the inner verandah being apparently always considered available as dormitories. *Madras.*

In addition to this objection, barracks so constructed are liable to the serious one that, from their great breadth, their thorough perflation is scarcely possible, except in a very strong wind, and their ventilation is therefore necessarily imperfect. The new barracks on the Race Course here, and the Infantry barracks, at Bellary, are without any means of roof ventilation. Their roofs are flat, and openings in them were no doubt considered unnecessary on the ground which I have heard stated, that as the object aimed at in the construction of buildings in India is to keep the interior of the rooms cooler than the outside air, their ventilation by connection is of course impossible. This is true to a great extent, but it is no less so that the most impure air in a barrack room, heated by the respiration of the men, and contact with their bodies, must, as a general rule, tend to rise towards the roof, and that the pressure of the wind, entering by the open doors and windows on the windward side, and acting equally in all directions, must tend to force it out through any openings which there may be.

For this reason I consider ridge ventilation to be of the utmost value in Indian barracks. At Cannanore, it has not been provided in any of the new buildings, either barracks or hospital, recently constructed, and this I think is much to be regretted. The objection to it there was, no doubt, the excessive rainfall on the coast, and the frequent entrance of rain in buildings so ventilated during the high winds of south-west monsoon, but that might easily have been obviated by the addition of a perforated metallic plate on the windward side of the ventilators.

The foregoing remarks are made by Deputy Inspector-General Dr. Barclay, of the Mysore Circle, and with his views I fully concur.

Secunderabad.—The recommendation of all Medical Officers that these barracks should be abandoned might have been stereotyped many years ago; but, although a site for Cavalry has been selected north of Trimulgherry, the works have not yet been commenced.

Dr. Marlow, in his report says that "there can be no doubt but that "the constitution of the 18th Hussars is now very greatly below par, and "whatever concurrent causes may have been at work in bringing about this "condition of the men, a prolonged residence in their present quarters will "assuredly further endanger the efficiency of the corps. Its fifth year of "service in India closed on the 31st December, 1868, and the third year in "Secunderabad was completed in February 1869, showing a death rate of "41·43 per mille, and a proportion of sick to strength reaching 9·45 per cent. "during 1868." This was brought to the notice of Government, and it was recommended that Her Majesty's 18th Hussars should be removed from Secunderabad, but their destination left to the military authorities.

The Begumpett Barracks were finally vacated on the 20th August, 1868, when the Royal Artillery were removed to Trimulgherry, so that the Cavalry may now be said to be the only British troops left in the old Secunderabad cantonments.

Trimulgherry.—Since the date of last report, two of the blocks of the large double-storied barracks so long under construction at North Trimulgherry, for the Royal Artillery, have been completed. They were handed over in August last to C Battery 20th Brigade, by whom they are at present occupied.

These magnificent buildings, built chiefly of granite, are placed upon the highest position of the most northerly part of Trimulgherry. They face the south-west, and are situated in the east of the Bolarum Road.

A large central stone staircase leads from the lower to the upper story. The rooms, both upstairs and downstairs, have spacious open verandahs on all

Madras. sides. The two main wards on either side of the staircase, both above and below, have been constructed to accommodate the same number of men in each, but at present the ground floor is arranged for dining rooms, offices, stores, &c., and the upper story is alone used as a dormitory. The floors are of rough slate. Ventilation seems perfect, and no defects of any kind have become apparent in the main buildings since they have been occupied.

Kamptee.—The Royal Artillery barracks have been frequently described, and have now all been condemned in consequence of their bad site and faulty construction.

Seetabuldee.—New buildings within the fort are nearly ready for occupation.

Rangoon.—The barrack bungalows, married quarters, guard rooms, orderly rooms, hospitals, &c., have been all ceiled with wood, reducing the temperature some 4 degrees Fahrenheit. These buildings have all been roof-ventilated.

Eventually these barracks are to be razed; and half stone half wooden houses are to be erected in their stead. As regards amount of accommodation for troops, it may be taken as a general rule that, except in the case at Port Blair and the Royal Artillery barracks at Rangoon, 30 men occupy the space allotted to 50 men; in some cases even a more liberal amount of space exists.

Port Blair.—Since last Report, the regimental guard room has been floored and enclosed. The barracks are in good order, as also all tributary buildings. The fine new stone barracks will not be completed for two years.

Tonghoo.—Steps are being taken to remove a large tract of jungle intervening between barracks and the river.

Hospitals. *St. Thomas's Mount.*—The female hospital at present in use is situated in rear of the men's hospital, and ill-adapted in every way for its purpose, and the Government have sanctioned a new one to be built upon modern sanitary principles, and it is now nearly fit for occupation.

Poonamallee.—There were never such unsuitable buildings for barracks or hospital. No one writes much on the subject at present, as we are informed that Ennore has been taken by the Government, and the depôt of Poonamallee is to be transferred there.

Trichinopoly.—The hospital has been divided during the year, and a portion, containing two wards, has been handed over to the Garrison Surgeon, for the treatment of Europeans at this station, or pensioners, or any others entitled to medical attendance. Dr. Gibbon considers this highly injudicious, for besides the inconvenience of having two separate hospitals under Medical Officers of the two services (British and Indian) in one compound, he thinks it also very improper that these people, who generally, from their intemperate habits, and from living among the Native population in the most unhealthy part of Trichinopoly, are the first to contract cholera or other contagious diseases, should be brought, as it were, into the very centre of the cantonment, and actually under the same roof with those soldiers who may be in hospital at the time.

There has been sufficient space left, however, for the treatment of the sick at the station, giving an average monthly cubic space to each man of 2799·91 feet.

Bangalore.—The new hospitals on the Race Course, at Bangalore, are approaching completion and will shortly, it is hoped, be handed over for occupation. They occupy an elevated and perfectly open site, at the north-east corner of the plateau, the nearest of the barracks being several hundred yards distant on their front. On the left it is intended to erect another pavilion, almost the counterpart of each of those now approaching completion. The new pavilion is to be for the Cavalry regiment, and those now approaching completion are intended for the Artillery and the Infantry.

Cannanore.—The new Artillery hospital at Cannanore, which has been taken into use during the year, is situated on a rising ground at the inland side of the "general parade ground," at its southern end, and is distant about 300 yards from the barracks, and 600 yards from the sea, towards which its front is directed. It faces slightly to the south of west, from which quarter the sea breeze most frequently blows. In front everything is open, but at the foot of the hill behind there are numerous cocoa-nut plantations, and much rice cultivation, and a few hundred yards off, on the right, there is the garrison

cemetery, which does not add to the cheerfulness of the prospect from the verandah of the female ward, which occupies that side of the hospital. The proximity of the cemetery is of course an objection to the site, but in other respects it appears to me to be about the best that could have been selected. It is sufficiently elevated above, and distant from, the cultivated lands behind, to be safe from any prejudical influence from them, and it is fully exposed to the sea breeze, while the slope of the ground away from it on all sides renders its drainage a matter of great ease. *Madras.*

The main building consists of an oblong block 97 feet in length, its basement raised about 2½ feet above the surrounding level, and its roof tiled, but without ridge ventilators. In the centre there are three wards for male patients, one 24, the other 19 feet in length, and each 18 feet in breadth, and 21 feet high. Along both front and rear, there is an enclosed verandah, 14 feet in breadth by 11½ in height; that in rear being subdivided by partition walls, so as to correspond with the wards, and in front there is also an open verandah, which is stated to add much to the comfort of the patients during the monsoon. There are eight glazed windows in the front verandah, and between each ward and the verandah on either side there are a door and two windows of good size, one half of the latter being venetianed and the other glazed.

There are eight openings for ventilation in the walls of the wards, 14 feet from the ground, but the addition of ridge ventilation is greatly to be desired.

The wards are provided with punkahs, and their floors are boarded. They are stated to be gloomy at all times, and as the number of men in hospital is usually very small, they are for the most part accommodated in the front verandah.

The "female hospital," which contains two wards, one 33½, and the other 14½ feet in length, and each 12 feet in breadth by 17 in height, occupies the whole of the north end of the building, and is completely isolated from the remainder of the accommodation. The necessary out-offices are behind. It is more than sufficient for the wants of the battery, as most of the women prefer to be treated in their quarters, and very few appear to be admitted into hospital.

Secunderabad.—No increase has been made in the hospital accommodation during the past year.

Kamptee.—No alteration of hospital or outbuildings during 1868.

Temperature in hot season excessively high in the wards, ranging from 96° to 104° F. All improvements suggested have been postponed, as it has been proposed to build ample hospital accommodation on the new site selected for barracks.

Thayetmyo.—Considerable changes have been made or are in progress. A fine hospital for the Royal Artillery is being built, as also another for the Infantry regiment.

Tonghoo.—There is no hospital, but two large well-built bungalows supply this want for the Royal Artillery and Infantry.

Wellington.—A new lavatory has been recommended, more conveniently situated, which is to be under cover, which the present one is not, and exposes the patients to cold and wet, when going to and from it; an estimate and plan have been sent in. *Lavatories.*

Mysore Circle.—A great deal is being done towards the improvement of the bath and lavatory accommodation in the Circle, but the improvements advance so slowly that the men have not yet profited very much by them.

At Bellary, the new lavatories are still far from complete, though progressing steadily. They afford excellent accommodation, the separate bathrooms attached to each, affording ample means for bathing with privacy.

At Bangalore an excellent new lavatory, attached to the Royal Horse Artillery barracks, has come into use during the year, and another equally good has been made over to the 16th Lancers, but the majority of those attached to the Cavalry and Artillery barracks on the Race Course, though affording ample accommodation, are most inconveniently arranged and uncomfortable.

The subject of the drainage of the plateau will be referred to again subsequently.

Madras. Plunge baths, of ample dimensions and excellent construction, have been provided on a most liberal scale for each of the barracks in Bangalore, and there is but one drawback to their being taken into immediate use. That, however, is a serious one, *the want of water.*

Secunderabad.—Ample in barracks, but limited in the large Trimulgherry hospital, used by the two Infantry regiments.

Kamptee.—In the Royal Artillery barracks there is one large swimming bath, common to the men of all three batteries, a part is reserved for the use of women, and partitioned off. Each battery has also a lavatory, with 20 fixed metal basins, and water supplied from cistern. There are small rooms also attached to each bath-room, containing tubs for private use.

In the Infantry barracks there are ten good wash-houses with fixed brass basins and large wooden tubs with troughs for foot bathing, also two large covered swimming baths, much used by the men.

Seetabuldee.—A lavatory, furnished with basins and wooden tubs, ample supply of water from wells, a large plunge bath in constant use.

Rangoon.—A project is proposed to be immediately carried out, of converting a low-lying piece of ground, immediately under the Infantry Lines, into an ornamental and extensive sheet of water. This will supersede the necessity of a swimming bath, a want hitherto much felt.

Port Blair.—A bath-room has been added to the hospital.

Thayetmyo.—A fine swimming bath is being made in the centre of the lines.

Tonghoo.—A swimming bath approaches completion.

Cooking. *St. Thomas's Mount.*—Kitchens sufficiently large and convenient. Cooking arrangements satisfactory as regards variety in the cooking of the rations, and it is wonderful how well the Natives cook with the apparently small means at their disposal. In the kitchens of the north and south barracks, each kitchen has been provided with one of Warren's cooking ranges, which answer admirably with a very small expenditure of fuel, viz., 1¼ lb. of wood: the expenditure of fuel, with the native means of cooking, is 3 lb. per ration. In the Horse Artillery barrack kitchens, they have the primitive means of cooking of former days.

Poonamallee.—Cook-houses most objectionable; they are in the same line, and close to the latrines. The most primitive means of cooking exist here, but the Native cooks prepare wonderful meals with the small means apparently at their disposal.

Madras.—Cooking is carried on in two houses; one close to the barracks, the other on the ramparts over the great latrines. The accommodation is too small for the regiment, so that the cook-houses are daily scenes of crowding and confusion.

Mysore Circle.—In this respect there has been no change during the year, no more ranges having been introduced, and the meals having continued to be cooked, for the most part, over open fire-places of primitive native fashion. In at least ninety-nine out of every hundred private houses in India, the cooking is done over such fire-places; and the Government of India is stated to have recently decided, that if covered with iron they are preferable to ranges for barrack kitchens, but they certainly are not so conducive to cleanliness, nor is it so easy to exercise efficient supervision over the operations of the native cooks employed at them.

Secunderabad.—Cook-houses adapted to the old native system in barracks and hospitals.

Kamptee.—Cook-houses placed 50 paces in front of the barracks (and too close to the latrines), not provided with flues, and adapted to the native system of cooking.

Burmah Circle.—The cooking continues to be done in the primitive native fashion, in copper vessels, frying pans, and chatties over open fires. On this subject I expressed my views fully in my Annual Report for 1867. I believe the advantage or otherwise of supplying stoves is now receiving the attention of Government.

By a reference to the remarks from St. Thomas's Mount, it will be seen that Surgeon-Major Fasson reports, that only one-half the amount of fuel is required with these ranges that is expended under the present native plan of cooking in open fire-places.

Madras. Diets.

Wellington.—The same as formerly. In addition, many of the men cultivate gardens, which supply them with various kinds of vegetables. At the coffee-shops, eggs, bacon, and nearly every other article can be obtained. Dr. Cowen is of opinion that the ration is not sufficient for this cool climate. The men have their rations cooked in the manner most agreeable to themselves.

The mutton is always good, beef also, as a rule; but complaints are now and again made that the bread is darker than it ought to be and sometimes underbaked, and when complaint is made to the Commissariat Officer the baker is always fined.

The vegetables and fruit grown here are almost equal to those at home, but many of the latter, such as apples, plums, pears, are too expensive for the men to purchase as a rule; but peaches, which are very plentiful and very cheap, are easily obtainable.

The Brazil cherry and hill gooseberry are plentiful and very wholesome, and make excellent preserves.

St. Thomas's Mount.—Rations consist of meat 1 lb. (beef or mutton), bread 1 lb., potatoes 1 lb., vegetables ¾ lb., tea ⅝ oz., or coffee 1¾ oz., sugar 2½ oz., and rice 4 oz. Meat and bread have been reported, and contractor fined.

Vegetables of nearly every description grown here with care and proper irrigation; cabbage, lettuce, peas, celery, French beans, and beet root, &c.

The usual tropical fruits grow here in perfection.

Poonamallee.—Hospital supplies generally are of good quality. Mutton is issued to the non-commissioned officers and men in barracks five days a week, and beef the other two days. The meat at one time was indifferent, especially the beef, but this has improved latterly. Bread 1 lb., potatoes ½ lb., rice 4 oz., tea ⅝ oz., sugar 2½ oz., firewood 3 lb.

Trichinopoly.—Ration consists of 1 lb. of meat, 1 lb. of bread (this is of very good quality), 1 lb. of vegetables, ⅝ oz. tea, 2½ oz. sugar, 4 oz. rice, ½ oz. salt, ½ oz. coffee (the latter is issued twice a week instead of tea). Beef and mutton are issued, the latter twice a week, and it is often of poor quality, owing to the great want of grass at the station for some months of the year. The pound of vegetables consists of potatoes, sweet potatoes, pumpkins, onions, and country greens, the amount of each varying according to the time of the year.

Fruits are not very varied at this station, consisting chiefly of limes, oranges, plantains, mangoes, pomeloes, cocoa-nuts.

Bangalore.—No change has taken place in the quantity of any of the articles supplied, and their quality appears to have remained much the same as during former years. The meat is generally described as having been "fair"; the mutton, however, being generally stated to have been "thin"; and in judging of its quality as well as of that of the beef, due weight appears to have been given to the difficulties as to pasturage, which undoubtedly exist at most Indian stations during a considerable part of the year.

So far as I am aware, no steps have been taken towards the introduction of the system of stall-feeding the animals (beyond the institution of a few experiments at Bangalore, which proved that the increased weight of animals so fed nearly makes up for the cost of the process), and until that is done really good meat will never be supplied to the troops in India.

At Bangalore, an extensive work has been built at great expense in the enclosure of the abandoned Infantry barracks, with all requisite machinery and appliances for grinding flour and manufacturing bread for the troops, and to outward appearance it has long been complete; but owing to some difficulties with the contractor, it has not yet been given over to the Commissariat Department, and the bread is at present manufactured under considerable difficulties in an old barrack-room. Occasional failure is the result; but it is a great matter to have security against intentional adulteration, and on the whole the bread generally tastes well, though dark in colour, and somewhat gritty. Its dark colour is said to be due to its being raised with *yeast* instead of with toddy (the fermented sap of the palmyra and other palms); the latter is said to improve the colour of the bread, but greatly to injure its keeping qualities; so much so, that bread raised with it and baked in the morning is frequently sour by the afternoon. Every obstacle is, of course, thrown in the way of the successful working of the Government bakery by

Madras. the native tradesmen, whose best customer the Commissariat has hitherto been, but the experiment has nevertheless been eminently successful.

Secunderabad.—There has been no change in the quantities of the articles issued, and no material alteration in the kinds or quality of the diet of the troops. The rations in the Secunderabad Command may be said generally to have been good and sufficient during 1868. The vegetables, however, might be very much improved, and a garrison kitchen garden should be established. Machine-made bread is still a desideratum; the Government bakery has not yet been established.

Kamptee.—Sufficiently nutritive. The mutton issued twice a week; generally poor and thin. Bread on the whole fair; supply of vegetables stated by the Surgeon of the Royal Artillery to have retrograded almost to what it was when there was no railway. There is no ostensible reason why the troops in this Command should not be as well supplied with vegetables as the force in Bombay.

Seetabuldee.—Have been good and sufficient during the year, but the supply of vegetables might be improved, seeing that Nagpore may be said to be within a few hours' journey from Mahableshwur, where potatoes are grown in large quantities.

Burmah Circle.—The rations throughout the year have been of a fair average quality, and have not formed the subject of complaint either on the part of the men or Medical Officers. The meat, almost invariably beef, is generally thin, owing, as the Medical Officer in charge of the 2nd Battalion 24th Regiment remarks, to the grass in the dry season being parched and non-nutritious, and to its producing a purgative effect during the rains. The beef bears, however, fair comparison with that generally served to the troops in India. It would be well if mutton could constitute a variety in the meat ration, but the climate is especially inimical to sheep, rendering it a difficult matter not only to fatten them, but to keep them alive. The hospitals are, however, regularly, indeed unfailingly, supplied with mutton, as also with excellent comforts.

Clothing. *Wellington.*—Woollen clothing only is used at this sanitarium.

St. Thomas's Mount.—Surgeon-Major Fasson writes:—"In my opinion the blue cloth worn by the non-commissioned officers and men is much too heavy, even at any season, here." Serge clothing has been issued to all the Royal Artillery at St. Thomas's Mount previous to my writing this report.

Bangalore.—The only change in the clothing of the troops has been the introduction of a serge coat for the Royal Artillery, or rather its sanction, for it has not yet been introduced at this station. It will be done as soon as possible. Dr. Barclay remarks, "Trousers, of some texture intermediate between cotton drill and thick woollen cloth, are however, still a desideratum both for Artillery and Cavalry." There can be no doubt in anyone's mind that the serge trouser is not calculated to stand much wear for the mounted branch of the service. The great desideratum has been gained by the adoption of a loose-fitting woollen jacket in place of the tight-buttoned cloth jacket or the cotton stable jacket, and before my next annual report is sent in, the serge jacket will have been supplied to all the Artillery and Cavalry.

Burmah Circle.—The different kinds of clothing adopted for the soldier have been found to fulfil their object satisfactorily, and due attention is paid as to regulating the description worn, according to the variations of the season. A considerate suggestion has been made by Assistant-Surgeon H. T. Chapman, in medical charge of the Left Wing, 76th Regiment, in his annual report, which, for the soldier's sake, is worthy of consideration. I quote the passage, as I quite endorse his views on the subject.—

"I think a great improvement, and at the same time a saving to Government, might be made by a less frequent issue of the red serge coat; at present the issue of both tunic and serge frock is quite out of proportion to their use; both are supplied once in two years, during which time the serge has been worn almost continually, with the exception of about three months a year in hot weather, while a man can count the number of times he has had his cloth tunic on, consequently, long before the time for the new issue arrives, the serge coat is worn out, and the 'old' cloth tunic is quite fresh and good, and sold in the bazaar for a few annas: the subject appears worthy of consideration;

however, the great improvement would consist in additional light tunics being substituted for unnecessary heavy ones." *Madras.*

Poonamallee.—The drainage is defective; the whole is surface drainage, and these, I have always found, kept in good order. There is a large pool of stagnant water close to a small tract of land called the Island Parcherry, which is inhabited by pensioners and natives. This pool might be advantageously filled up; but as this depôt, it is said, is to be done away with, and the men removed to Ennore, where barracks, &c., are erected, I imagine the authorities would be loth to expend any more money on Poonamallee than they can possibly help. *Drainage.*

Bangalore.—Dr. Barclay writes, "it has been already mentioned that subsoil drainage has not been introduced anywhere within the Mysore circle; and this, I think, is matter for regret, although I believe that such drainage is less required in this circle than almost anywhere else in India."

"There can be no doubt that the old 'Dragoon' Barracks and hospital at Bangalore, now occupied by the infantry regiment stationed there, would be the better for it, but I do not think it is much required on the race-course plateau, where the level of the subsoil water is always far from the surface; and the Engineers object to it there on the ground that it would dry up all the wells from which the drinking water is at present obtained. At Bellary the rain-fall is very slight, and there, also, the level of the subsoil water is generally far from the surface, and at the posts on the western coast the drains, if made, would have, in most instances, to be cut in the porous laterite rock, on which the barracks rest."

A series of V-shaped drains have been constructed during the year at Dr. Barclay's suggestion, around the outside of the walls of the old "Dragoon" hospital, now occupied by the Infantry, and the greatest benefit may be looked for from them during the ensuing monsoon. At that season last year the ground around the hospital was frequently little better than a quagmire, and it was often difficult to keep the lower ward from being flooded.

At Bellary saucer drains of granite were being constructed between the blocks of the Infantry Barracks at the date of Dr. Barclay's inspection, but they did not strike him as being much more than sufficient to carry off the refuse water from the ablution rooms. The whole of the area occupied by the barracks of the European troops at that station is in need of surface drainage.

Secunderabad.—Dr. Marlow, in his report, writes as follows:—"This subject is at present more important than any other connected with the sanitary state of the new cantonment. The want of proper drainage was especially dwelt upon last year, and the evils arising therefrom cannot be too frequently brought to notice."

Numerous buildings now occupy the space in the new cantonment. The soil consists of disintegrated granite, highly absorbent of water, and of no great depth, with the rock beneath acting as an impermeable subsoil. The impurities which the soil contains (daily increasing round the cook houses, lavatories, and men's barracks), together with high temperature, are precisely the conditions essential for the production of malaria. The buildings have now been inhabited long enough to change the conditions of the soil, which is becoming loaded with organic matters. The time has arrived for a comprehensive and efficient system of drainage of the lines of the Royal Artillery, and 1st and 2nd European Infantry Regiments. The present system does not meet existing requirements. Although the carrying off of the refuse water from most of the wash-houses may have been provided for, there is no drainage whatever for the storm water from these buildings, or from the kitchens or men's barracks, beyond the natural surface channels. Therefore the porous soil becomes saturated close round the basements, and in the immediate neighbourhood. There should be pavement extending from four to six feet from the walls round each barracks and subsidiary buildings, family quarters, and hospital bordered by gutters for carrying off all waste water. I consider that the sanitary condition of the vicinity of the barracks generally is unsatisfactory, and that it is dangerous to trust solely to the natural slope of the surface after the ground has been so long

Madras.

occupied; and I am of opinion that the efficient drainage of the lines of the Royal Artillery and 1st and 2nd European Infantry Regiments is a sanitary necessity. This has been brought to the notice of the military authorities. And it is my intention to bring this again to the notice of His Excellency the Commander-in-Chief with a view to steps being taken to remedy the evil, but I fear it will be years before a thorough system of drainage at Secunderabad will be carried out from want of funds.

Kamptee.—The European Infantry barracks are each surrounded by small open drains; these empty themselves into large ones, meeting with those from the cook-houses. The whole finally is carried by one large open drain to a nullah about 200 yards from the barracks, but to the windward side; this is also objectionable, on account of the drainage forming for itself a kind of cesspool which is not carried away until the ravine is flushed by the rains.

Improvements required.

In conclusion, though many sanitary improvements and changes have taken place during the year, which are fully recorded in the Reports by the executive Medical Officers of Circles, I would here note that those most needed are:—

1. The adoption of the dry-earth system of conservancy in every latrine used by both Europeans and Natives; it is in course of construction for the former, but the work progresses but slowly.

2. The universal supply of cooking ranges for barracks and hospitals; these were recommended in my report for 1867.

3. That early measures be taken for the removal of the invalid depôt from Poonamallee to the marine site at Ennore, approved of by Government; and as all repairs to the Poonamallee depôt barracks were stopped, it becomes the more necessary that the work at Ennore should be pushed forward.

4. It is in contemplation, I believe, to build new barracks at Kamptee; instead of doing so, I would recommend for consideration the advisability of removing the whole force to the Chiculda Hills, from whence the troops could be moved down to Nagpore in a short time should they be required, or 2 Companies of Infantry and a Battery of Royal Artillery might be stationed at Seetabuldee.

5. Thorough drainage of the whole site of the new cantonment of Trimulgherry."

III. Bombay.

Bombay.

The average strength of the European troops serving in the Bombay Command during the year was 9,820; the admissions into hospital amounted to 10,784, and the deaths to 152, of which 12 occurred out of hospital and 16 among invalids on their passage to England and at Netley. These numbers give the ratio of 1,098 admissions, and 15·48 deaths per 1,000 of mean strength, both considerably under the amount in the preceding year.

The influence of the different classes of diseases in causing this sickness and mortality is shown in the following Table. The details for 1868 are given in the Abstract No. 25 in the Appendix:—

Order.	Diseases.	1868. Strength, 9,820. Admissions.	Deaths. In India.	Deaths. Of Invalids.	Deaths. Total.	Ratio per 1,000. Admitted.	Ratio per 1,000. Died.	1860-67. Ratio per 1,000. Admitted.	1860-67. Ratio per 1,000. Died.
	Class I.								
1	Miasmatic Diseases ..	4,631	38	1	39	471·5	3·97	825·1	13·00
2	Enthetic „ ..	1,941	2	1	3	197·6	·31	255·9	·27
3	Dietic „ ..	213	3	..	3	21·7	·31	20·3	·23
4	Parasitic „ ..	62	..	..	..	6·3	..	10·8	..
	Class II.								
1	Diathetic Diseases ..	78	..	1	1	7·9	·10	10·0	·20
2	Tubercular „ ..	106	15	6	21	10·8	2·14	10·0	1·95
	Class III. Diseases of the—								
1	Nervous System ..	295	6	..	6	30·0	·61	34·1	1·39
2	Circulatory „ ..	93	12	5	17	9·5	1·73	12·5	·88
3	Respiratory „ ..	346	4	2	6	35·2	·61	48·4	·82
4	Digestive „ ..	932	32	..	32	94·9	3·25	116·4	3·23
5	Urinary „ ..	29	1	..	1	3·0	·10	2·6	·07
6	Reproductive „ ..	109	..	..	..	11·1	..	12·3	..
7	Locomotive „ ..	30	..	..	..	3·1	..	4·8	·01
8	Integumentary „ ..	885	..	..	..	90·1	..	98·2	·08
	Class IV.								
4	Diseases of Nutrition.	107	..	..	..	10·9	..	6·5	·14
	Class V.								
1	Accidents	919	20	..	20	93·6	2·04	96·4	1·57
3	Homicide	1	..	..	..	·1	..	..	·05
4	Suicide	3	3	..	3	·3	·31	..	·45
5	Execution	..	..	..	..	..	..	..	·02
6	Corporal Punishment	4	..	..	..	·4	..	1·6	..
	Diseases not specified	..	..	..	..	..	..	·7	·08
	Total	10,784	136	16	152	1098·0	15·48	1566·6	24·44

The admissions and deaths were very much under the average of the last eight years. The decrease in the former was chiefly in miasmatic diseases, and though to a less extent, in enthetic diseases and those of the respiratory and digestive systems; in the deaths it was almost entirely in the class of miasmatic diseases.

Miasmatic Diseases were one-fifth less prevalent and three-fifths less fatal than in 1867, and the reduction is still more marked on comparison with the average of the last eight years. When subdivided they give the following results:—

Bombay.

Diseases.	Admitted.	Died.	Ratio per 1,000 of Strength. 1868. Admitted.	1868. Died.	1860–67. Admitted.	1860–67. Died.
Eruptive Fevers	20	1	2·0	·10	1·7	·18
Paroxysmal „	2,523	10	256·9	1·02	458·6	1·65
Continued „	401	4	40·8	·41	88·9	1·23
Dysentery and Diarrhœa	688	14	70·1	1·48	128·6	2·91
Spasmodic Cholera..	14	8	1·4	·81	8·4	5·23
Sorethroat and Influenza	158	..	16·1	..	20·6	·02
Ophthalmia	325	..	33·1	..	50·1	..
Rheumatism.	401	2	40·8	·20	59·2	·04

The admissions have been lower than in 1867 by all these diseases except eruptive and continued fevers, which show a trifling increase, but the decrease has been most marked in paroxysmal fevers. The mortality by dysentery and diarrhœa has only amounted to half, and by cholera to less than one-sixth of the average. Spasmodic cholera did not prevail in an epidemic form in the Command during the year.

ENTHETIC DISEASES though considerably under the average have been only 12 per 1,000 of the strength below the proportion in 1867. The reduction has taken place equally in syphilitic and gonorrhœal cases.

ACCIDENTAL AND VIOLENT DEATHS were considerably above the average; more than half of them were by sunstroke. There were two deaths by poison, one accidental from eating poisonous mushrooms, and the other suicidal by cyanide of potassium; two men also committed suicide with fire-arms.

The admissions and deaths at the principal stations in each of the Military Divisions, are shown in the following Table :—

Military Divisions.	Stations.	Average Annual Strength.	Admitted into Hospital.	Died in India.	Ratio per 1,000.			
					Admitted.	Died.	Average of Eight Years. Admitted.	Died.
Presidency ..	Colaba	526	555	1	1055·1	1·90	1529·8	23·62
Poona ..	Poona..	1,590	2,068	26	1271·0	16·35	1310·8	13·47
	Sattara.	50	44	1	880·0	20·00	1174·2	8·25
	Ahmednuggur ..	247	534	5	2161·9	20·24	1437·1	11·77
	Asseerghur. ..	129	202	1	1565·9	7·75	1426·8	17·64
	Belgaum	925	1,028	11	1111·4	11·89	1166·6	11·18
	Kirkee	472	601	12	1273·3	25·42	1557·4	10·20
	Sholapoor	116	261	1	2250·0	8·62	1609·6	17·12
Mhow ..	Mhow	1,134	1,187	10	1046·7	8·82	1739·1	14·85
	Indore	78	105	1	1346·2	12·82	1638·3	13·83
	Neemuch	263	434	1	1650·2	3·80	2624·2	49·43
	Nusseerabad ..	635	706	7	1111·8	11·02	1944·9	35·79
	Ajmere.	50	44	..	880·0	..	2192·3	20·98
Northern ..	Deesa..	723	688	5	951·6	6·91	1344·5	13·85
	Ahmedabad. ..	261	399	4	1528·7	15·32	1896·2	18·25
	Mount Aboo ..	94	63	1	670·2	10·64	1588·8	19·72
Scinde ..	Kurrachee	750	720	16	960·0	21·33	1231·3	12·24
	Hydrabad	335	236	4	704·5	11·94	1244·8	12·61
	Aden	665	503	10	756·4	15·04	1096·4	24·27
	Sanitaria & Invalids ..	158	329*	17	2082·3	107·59	..	..
	On the March. &c.	488	420	2	860·6	4·10	1166·8	32·16

* Some of these were re-admissions of cases already accounted for at other stations.

The ratio of admissions was lower than in 1867 at all the stations except Ahmednuggur, Asseerghur, Sholapoor, and Kirkee, and at none was it very high except Ahmednuggur and Sholapoor. The highest rate of mortality, exclusive of Sanitaria and Invalids, was at Kirkee, and the only other stations at which it materially exceeded the average were Kurrachee and Ahmednuggur.

On comparing the ratios with the average of preceding years there will be found an increase in the admissions at Ahmednuggur, Asseerghur, and Sholapoor, and in the deaths at Poona, Sattara, Ahmednuggur, Kirkee, and Kurrachee, and a decrease at all the other stations. At Sattara the increase in the mortality is more apparent than real, as only one death occurred at the station ; at Poona and Kirkee it was in a great measure due to cholera.

The following Table shows the admissions and deaths by the different classes of diseases in each of the Military Divisions :—

Order.	Military Divisions	Presidency.		Poona.		Mhow.		Northern.		Scinde.		Aden.		Troops on March		Presidency.		Poona.		Mhow.		Northern.		Scinde.		Aden.		Troops on March.	
	Average Annual Strength	529		3,529		2,160		1,078		1,085		665		488		Annual Ratio per 1,000 of Strength.											
	Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
	Class I.																										
1	Miasmatic Diseases ...	337	...	2034	25	974	5	431	2	410	2	274	3	207	...	637·0	...	576·4	7·08	450·9	2·31	399·8	1·85	377·9	1·84	412·0	4·51	424·2	...
2	Enthetic ,, ...	34	...	956	2	462	...	230	...	140	...	57	...	62	...	64·3	...	270·9	·57	213·9	...	213·4	...	129·0	...	85·7	...	127·1	...
3	Dietic ,, ...	10	...	107	1	62	1	13	...	27	1	1	...	4	...	18·9	...	30·3	·28	28·7	·46	12·1	...	24·9	·92	1·5	...	8·2	...
4	Parasitic ,, ...	...	...	39	...	8	...	6	...	7	...	1	...	...	...	...	...	11·0	...	3·7	...	5·6	...	6·4	...	1·5	...	...	...
	Class II.																										
1	Diathetic Diseases ...	...	...	30	...	16	...	15	...	4	...	4	...	5	...	...	...	8·5	...	7·4	...	13·9	...	3·7	...	6·0	...	10·2	...
2	Tubercular ,, ...	1	...	38	4	15	1	10	3	12	1	5	...	3	...	1·9	...	10·8	1·13	6·9	·46	9·3	2·78	11·1	·92	7·5	...	6·1	...
	Class III.																										
	Diseases of the—																										
1	Nervous System ...	9	...	114	3	99	...	28	...	45	2	20	...	5	...	17·0	...	32·3	·85	31·9	...	26·0	...	41·5	1·85	30·1	...	10·2	...
2	Circulatory ,, ...	4	...	33	3	12	2	17	1	6	2	5	...	2	...	7·6	...	9·3	·85	5·6	·93	15·8	·93	5·5	1·85	7·5	...	4·1	...
3	Respiratory ,, ...	14	...	144	2	99	2	27	...	33	1	19	...	7	...	26·5	...	40·8	·57	45·8	·93	25·0	...	30·4	·92	28·6	...	14·4	...
4	Digestive ,, ...	40	1	437	9	193	5	126	2	81	3	29	4	21	1	75·6	1·89	123·8	2·55	89·4	2·31	116·9	1·85	74·6	2·76	43·6	6·01	43·0	2·05
5	Urinary ,, ...	...	...	6	1	9	...	8	...	3	...	3	...	2	...	...	...	1·7	·28	4·2	...	7·4	...	2·8	...	4·5	...	4·1	...
6	Reproductive ,, ...	8	...	38	...	43	...	9	...	7	...	3	...	4	...	15·1	...	10·8	...	19·9	...	8·3	...	6·1	...	4·5	...	8·2	...
7	Locomotive ,, ...	2	...	9	...	11	...	2	...	3	...	2	...	3	...	3·8	...	2·5	...	5·1	...	1·9	...	2·8	...	3·0	...	6·1	...
8	Integumentary ,, ...	57	...	351	...	219	...	106	...	79	...	43	...	49	...	107·7	...	99·5	...	101·4	...	98·3	...	72·8	...	64·7	...	100·4	...
	Class IV.																										
4	Diseases of Nutrition ...	5	...	54	...	13	...	19	...	12	...	...	...	46	...	9·4	...	15·3	...	6·0	...	17·6	...	11·1	...	...	...	94·3	...
	Class V.																										
1	Accidents	34	...	344	6	270	3	102	1	87	8	37	2	...	1	64·3	...	97·5	1·70	125·0	1·39	94·6	·93	80·2	7·37	55·6	3·01	...	2·05
3	Homicide	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	·3	...	...	...	...	...	...	...	...	...	...	...
4	Suicide	...	...	1	1	1	...	...	1	...	...	...	1	...	...	...	...	·3	·28	...	·5	...	·93	...	...	...	1·50	...	...
6	Corporal Punishment ...	1	...	2	...	...	...	1	...	...	...	...	...	...	...	1·9	...	·6	...	...	...	·9	...	...	...	...	...	...	...
	Total	556	1	4738	57	2476	19	1150	10	956	20	503	10	420	2	1051·0	1·89	1342·6	16·14	1146·3	8·79	1066·8	9·27	881·1	18·43	756·3	15·03	860·6	4·10

Bombay.

The admissions have been lower than in 1867 in all the Military Divisions except Poona, and among the troops on the march. The mortality has been higher than in that year in the Poona, Scinde, and Aden Divisions, but in none has it reached as high as 2 per cent. of the strength.

MIASMATIC DISEASES have given rise to the following ratio of admissions and deaths:—

Bombay.

Military Divisions ...	Presidency.		Poona.		Mhow.		Northern.		Scinde.		Aden.		Troops on the March.		Presidency.		Poona.		Mhow.		Northern.		Scinde.		Aden.		Troops on the March.	
Average Annual Strength ...	529		3,629		2,160		1,078		1,085		665		438		Annual Ratio per 1,000 of Mean Strength.													
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Eruptive Fevers	...	...	9	1	9	...	...	...	2	...	...	...	2	...	...	...	2·6	·28	4·2	...	...	...	1·8	...	...	...	4·1	...
Paroxysmal ,, ...	253	...	1159	6	590	2	256	1	174	...	19	1	123	...	478·3	...	323·4	1·76	273·2	·93	237·5	·93	160·3	...	28·6	1·50	252·0	...
Continued ,, ...	1	...	184	1	34	1	19	...	45	1	104	1	10	...	1·9	...	52·1	·28	15·7	·46	17·6	...	41·5	·92	156·4	1·50	20·5	...
Dysentery and Diarrhœa ...	35	...	309	7	132	2	42	1	74	1	63	1	35	...	66·2	...	87·6	1·98	61·1	·93	39·0	·93	68·2	·92	94·7	1·50	71·7	...
Spasmodic Cholera ...	...	...	11	8	...	...	...	...	...	...	...	...	...	...	...	...	3·1	·27	...	...	...	...	...	...	...	...	...	...
Sorethroat and Influenza ...	6	...	73	...	38	...	21	...	14	...	5	...	10	...	11·3	...	20·7	...	17·6	...	19·5	...	12·9	...	7·8	...	8·2	...
Ophthalmia	7	...	104	...	54	...	47	...	36	...	65	...	13	...	13·2	...	29·5	...	25·0	...	43·6	...	33·2	...	97·8	...	26·6	...
Rheumatism	30	...	157	2	94	...	34	...	51	...	11	...	10	...	56·7	...	44·5	·57	43·5	...	31·5	...	47·0	...	16·5	...	20·5	...

Eruptive Fevers did not prevail to any extent. The cases at Poona were chiefly smallpox and chicken-pox; and at Mhow, measles. The only fatal case was one of scarlet fever at Poona. *Bombay.*

Paroxysmal Fevers were much more prevalent than in 1867 in the Presidency and Poona Divisions, but much less prevalent in all the others. The increase in the Presidency occurred in the 1st Battalion 23rd Regiment, and was attributed by the Medical Officer in charge to the previous residence of the men for two years at Jubbulpore, where malarious fevers are extremely prevalent. In the Poona Division the highest proportion of admissions by this group of fevers occurred at Sholapoor, where the E Battery 18th Brigade Royal Artillery had 163 cases in an average strength of 116 men. Asseerghur and Kirkee were the two stations which furnished the next highest proportions, the former having had 68 cases in 129 men, and the latter 213 cases in 472 men; but the troops at Asseerghur consisted of a detachment of the 23rd Regiment, and the great prevalence of malarious fever in it is attributed, as in the Head-Quarters at Colaba, to the predisposition acquired during the preceding service of the Regiment at Jubbulpore. At Kirkee, the A Battery E Brigade Royal Horse Artillery, and the 5th Battery 5th Brigade Royal Artillery, furnished much the highest proportion of cases; the Medical Officers in charge state that these occurred chiefly among recruits recently arrived from England.

Continued Fevers were above the average in the Poona and Aden Divisions, but in the latter they were less prevalent than in the preceding year. In the former the excess occurred in the 96th Regiment at Poona, in the latter in the two batteries of Royal Artillery and the Head-Quarters of the 1st Battalion 2nd Regiment, and their prevalence was attributed to the excessive heat.

Dysentery and Diarrhœa were more prevalent than in 1867 in the Poona Division, and at Aden. In the former Belgaum was the station which furnished the highest proportion of cases, but this was attributed to the 108th, which occupied it during the last nine months of the year, having come from Secunderabad, where it had suffered severely from dysentery.

Spasmodic Cholera did not prevail as an epidemic at any of the station, during the year. The only Division in which any cases occurred among the troops was the Poona, in which there were 11 cases and 8 deaths. In January, a fatal case occurred in the 45th Regiment at Poona. Between the 13th and 20th August there were three cases, of which two died, in the B Battery E Brigade Royal Horse Artillery, and on the 26th of the same month a fatal case in the G Battery 14th Brigade, at Ahmednuggur. In September, two cases which recovered occurred at Kirkee, one in the 5th Battery 5th Brigade, and the other in the D Battery 18th Brigade Royal Artillery, and at the same station there was a fatal case in A Battery E Brigade Royal Horse Artillery in the end of October, and three fatal cases in November, in the C Battery E, the 5th Battery 5th, and the D Battery 18th Brigades respectively.

Ophthalmia was less prevalent than in the preceding year in all the Divisions except Aden, where in June and July it prevailed as an epidemic in the 1st Battalion 2nd Regiment, while the two batteries of Royal Artillery at the same station were not affected. It was attributed by the Medical Officer in charge to the hot dry winds, the clouds of dust, the glare of the sun, the want of fresh water for ablution, and the want of tone on the part of the men after a residence of nearly two years at Aden; but all these were in operation on the men of the Artillery without producing any corresponding effect. In an average strength of 536 men there were 65 admissions into hospital during the ten months these troops were at Aden in 1868, which gives an *annual* ratio of 145 per 1,000 of the strength. The disease ceased as an epidemic after July, but cases continued to occur until the end of the year.

ENTHETIC DISEASES were more prevalent than in 1867 in the Mhow, Northern, and Aden Divisions, but in the last, notwithstanding the increase, the ratio was very low, amounting only to 86 per 1,000. Their prevalence was greatest in the Poona Division, Belgaum and Ahmednuggur being the stations which furnished the highest proportions. The Presidency and Aden had the greatest immunity from these diseases. During the year an Act came into operation under which supervision of prostitutes and the establishment of lock hospitals at the principal stations were authorized, but it has not been in

Bombay. operation for a sufficient period to have produced as yet any material effect upon the prevalence of this class of diseases.

Diseases of the Digestive System were more prevalent than in 1867 in the Poona and Northern Divisions; the principal diseases were dyspepsia and hepatic affections.

Accidental and Violent Deaths were very high in the Scinde Division, owing to the occurrence of 6 by sunstroke at Kurrachee and 2 at Hydrabad in the month of June. Four cases, all of which died, occurred in the A Battery 18th Brigade Royal Artillery, and three, of which two died, in the 82nd Regiment at Kurrachee, between the 5th and 9th of June; the weather is stated to have been hotter than was ever experienced at that station. At Hydrabad four cases with two deaths occurred in the 4th Battery 5th Brigade Royal Artillery, and four cases which recovered, in the detachment 1st Battalion 2nd Regiment. In addition to these deaths sunstroke caused one at Belgaum, one at Ahmedabad, one at Mhow, and one at Aden.

The admissions and deaths in each corps are shown in the following Table:—

Regiments.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Annual Ratio per 1,000.		Stations during the Year.
			In Bombay.	Of Invalids.	Total.	Admitted.	Died.	
CAVALRY.								
2nd Dragoon Guards	396	456	2	..	2	1151·5	5·05	Mhow, 12 months.
3rd „ „ Left Wing	94	98	2	..	2	1042·8	21·28	Ahmednuggur, 4⅔ months; proceeded to England.
3rd Hussars	14	14	..	..	..	1000·0	..	Arrived from England, 19th December; Poona, ⅓ month.
4th „	38	50	..	..	..	1315·8	..	On the march to Bengal, 1 month.
Total Cavalry	542	618	4	..	4	1140·2	7·38	
ROYAL ARTILLERY.								
E Brigade R. H. A.	537	883	14	..	14	1644·3	26·07	Head-Quarters and A Battery, Kirkee, 12 months. B Battery, Ahmednuggur, 11 months; Kirkee, 1 month. C „ Kirkee, 10⅓ months; on the march, 1⅔ month; Hydrabad, ⅓ month. D „ Mhow, 12 months.
5th Brigade R. A.	219	269	7	..	7	1228·3	31·96	No. 4 Battery, Hydrabad, 12 months. No. 5 „ Kirkee, 11 months; proceeded to Madras. No. 6 „ Belgaum, 10½ months; *en route* to Madras, ½ month.
14th „ „	480	630	6	..	6	1312·5	12 50	Head-Qrs. and D Battery, Ahmedabad, 12 months. E Battery, Deesa, 10 months; on the march, 2 months. F „ Nusseerabad, 12 months. G „ Arrived from Abyssinia 14th June; Poona, 1 month; Ahmednuggur, 5½ months.

Regiments.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Annual Ratio per 1,000.		Stations during the Year.
			In India.	Of Invalids.	Total.	Admitted.	Died.	
ROYAL ARTILLERY—*cont.*								
18th Brigade R.A.	805	1,157	12	1	13	1437·3	16·15	Head-Qrs. and A Battery, Kurrachee, 12 months. B Battery, Ahmedabad, 10 months; on the march, 2 months. C „ Belgaum, 12 months. D „ Kirkee, 12 months. E „ Sholapoor, 12 months. F „ Neemuch, 12 months.
21st „ „	241	271	5	1	6	1124·5	24·90	Head-Qrs. and No. 6 Battery, Mhow, 10 months; proceeded to England. No. 1 Battery, Aden, 12 months. No. 4 „ Aden, 12 months.
5th Batt. 25th Brigade R.A. ..	48	105	..	..	..	2187·5	..	No. 5 „ Arrived from Abyssinia 12th June, Poona, 4 months; proceeded to Bengal.
Total Artillery	2,330	3,315	44	2	46	1422·7	19·74	
INFANTRY.								
2nd Battalion 1st Foot	692	796	9	..	9	1150·3	13·01	Nuseerabad, 12 months; Detachments at Ajmere, 12 months; Deolalee, 8 months; Neemuch, 1 month.
1st „ 2nd „	815	582	10	1	11	714·1	13·50	Aden, 10½ months; Poona, 1½ month; Detachment at Hydrabad, 12 months.
1st „ 8th „	116	116	1	..	1	1000·0	8·62	Arrived from Malta 3rd November; Poona, 2 months; Detachment at Sattara, 1½ month.
1st „ 23rd „	707	844	3	6	9	1193·8	12·73	Poona, 2⅓ months; Colaba, 9⅔ months; Detachment at Asseerghur, 12 months.

Regiments.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Annual Ratio per 1,000.		Stations during the Year.
			In Bombay.	Of Invalids.	Total.	Admitted.	Died.	
INFANTRY.—*cont.*								
26th Regiment	259	181	2	1	3	698·8	11·58	Belgaum, 2½ months; proceeded to Abyssinia; Depôt, Poona, 2 months.
46th „	533	731	8	1	9	1371·5	16·88	On the march, ½ month; [illegible], 8½ months; proceeded to England.
49th „	794	619	5	1	6	779·6	7·56	Deesa, 12 months; Detachment at Mount Aboo, 12 months.
82nd „	720	572	17	..	17	794·4	23·61	Kurrachee, 10 months; Aden, 2 months; Detachment at Kurrachee, 2 months.
95th „	727	661	8	1	9	909·2	12·38	Mhow, 12 months; Detachment at Indore, 12 months.
96th „	762	867	11	1	12	1137·8	15·75	Poona, 12 months; Detachment at Neemuch, 12 months.
108th „	782	917	12	..	12	1172·6	15·34	Colaba, 2⅓ months; *en route* to Belgaum, ⅔ month; Belgaum, 9 months.
Total Infantry	6,907	6,886	86	12	98	997·0	14 19	

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The ratio of admissions has been highest in the Artillery and lowest in the Infantry; that of the deaths has also been highest in the Artillery but lowest in the Cavalry. There was no very marked excess of admissions in any corps. The death rate was very high in the 5th Brigade Royal Artillery and the E Brigade Royal Horse Artillery; in the former the excess was greatly due to the deaths from sunstroke at Hydrabad, already noticed, and one by cholera at Kirkee, and in the latter to fever and cholera at Kirkee and Ahmednuggur. The 82nd Regiment had the highest ratio of deaths in the Infantry; hepatitis, probably in some cases at least, the result of previous service in Bengal, was the cause of one-third of the deaths, and there were also two deaths by sunstroke and two by accidental drowning in the corps.

SANITARY REPORT.

Inspector-General Gordon, C.B., reports:—

Barracks.—Continued progress has been made throughout the year in the construction of new barracks, in the gradual demolition of those deemed unfit for further occupation, and in the improvement of the remainder. In some instances, barracks known to be defective have been unavoidably occupied, owing to the want of better accommodation, as was especially the case at the General Depôt, Kurrachee. These barracks are old, low, ill-ventilated buildings, of radically bad construction, and unfit for permanent occupation by European troops, as was evidenced by the sickness and mortality which prevailed among the troops quartered in them during the past year. The new barracks which have been taken into use at Deolalee and some other stations give general satisfaction.

Accommodation.—As a general rule the accommodation in barracks rather exceeded than fell short of the regulation allowance.

Ventilation.—The ventilation of both barracks and hospitals appears to be quite satisfactory.

Ablution Arrangements.—These have been favourably reported on. At Nusseerabad, Poona, and Kirkee the requisite supply of water has been maintained, although not without considerable expense.

Latrines.—The dry-earth system of conservancy has been continued at all stations with the exception of Colaba, where Macdougall's powder has been used instead; in both cases with perfectly satisfactory results.

Cook-rooms.—The newly constructed rooms with chimneys and windows fulfil all the required conditions.

Dieting.—The arrangements under which the food rations are supplied meet with general approval.

Water Supply.—Continued attention has been given to the filtration of the water used for drinking purposes. Government has now ordered from England a certain supply of the patent silicated carbon filters; and if these are found to work satisfactorily, they will be supplied to all the hospitals in lieu of the filtering ghurras now in use.*

Clothing.—Serge clothing has now been ordered to be introduced into the Artillery. This arm, and the Infantry, will therefore in future be provided with clothing suitable to the climate. It is to be regretted that serge clothing has not also been ordered for the Cavalry, as it is impossible that the thick, heavy, tight-fitting cloth overalls, jackets, &c., can be conducive to health, and still less to comfort, in this country.

Drainage of Camps, &c.—There was an unusual prevalence of ague at Sholapoor during the past year, which was attributed by the Medical Officer in charge of the Artillery to the marshy condition of the ground below the tank. It is believed that steps are being taken to drain the marshy ground, and, if necessary, to deepen the tank.

* *Vide* War Office Circulars, "Filters for the Purification of Water," page 374 of this volume.

The introduction of the new Cantonment Act, and the establishment of Lock hospitals at the principal military stations, effected during the past year, cannot fail to be attended with beneficial results, which may be expected to manifest themselves in future years. As yet, they have not been long enough in operation to have been followed by marked effects.

POONA DIVISION.

Deputy Inspector-General Stewart, in his Sanitary Report of the Poona Division of the Bombay Army for 1868, makes the following remarks:—

Before proceeding to notice individual stations in the Division, with the alterations and improvements effected during the year at each, as regards barracks, hospitals, &c., I may as well here offer a few general remarks on the main points affecting the health of the troops; and, first, as regards their quarters:—

Barracks.—Much has been done, and is now being done; splendid upper-storied barracks have been nearly finished at some stations, and are in progress at others.

Space.—In none of the barracks has there been any overcrowding, the cubic and superficial regulation allowance has been carefully attended to. A few trivial exceptions will be noticed in the proper place. As a rule, when the regulated proportion has been unavoidably diminished, the space has been supplemented by tents for the men to sleep in, as at the general depôt, Poona, during the invaliding season; and at certain stations, *Hill Port* at Sattara, and *Musjid Barracks*, Asseerghur, for example, although the regulated 90 and 1,200 feet has not been enforced, the elevated site and the construction of the rooms, giving free circulation by numerous doors and windows, has rendered the necessity for fewer inmates less imperative.

A good deal has been done in some of the old and faulty barracks to improve ventilation, flooring, and the better appropriation of space, but some have been so often reported on as unfit for occupancy that they are not worth repair, and will be removed as the new barracks spring up.

Guard Rooms, &c.—The construction of the guard rooms, cells, and other subsidiary buildings has been strictly attended to. Extra accommodation has to be furnished at more than one station for the occupants by pitching tents; at all the new barracks now constructing, spacious guard rooms, &c., are furnished.

Patcherries.—The married quarters at most of the stations are very comfortable, each family having two rooms with share of kitchen, &c., and new ranges are being erected where much required, as at Sholapore.

Conservancy.—The dry earth system is in universal operation and answers well. Sheds for dry earth storage have been erected, the receptacles are regularly *dammered* or tarred, and great attention is paid to the fittings.

Latrines.—At a few stations only are the latrines on the old pattern without oblique partitions, but these are being gradually introduced.

Urinals.—Care is taken that all filth is regularly removed to a sufficient distance from barracks and cantonments; glazed earthern urinals would be, I think, an improvement on the present iron receptacles.

Health Board.—As bearing upon the conservancy of stations, the Cantonment Act has come into force during the year throughout the Command.

A Board of Health, consisting of the senior Military and Medical Authorities, the Engineer, the Cantonment, and other Magistrates assemble monthly "or oftener if necessary," and "pass resolutions," and "make recommendations," and "receive Reports" on sanitary matters; but their hands are sadly cramped for want of funds to carry out their recommendations.

Water.—The water is chiefly derived from tanks conveyed by aqueducts or pipes, and from wells; for drinking purposes it is always filtered, both in barracks and hospitals. The construction of the filtering apparatus is capable of improvement, and this is about to be carried out.

New Works.—Important works are sanctioned and will shortly be commenced, for better water supply to certain stations to be mentioned hereafter.

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Lavatories.—Excellent new lavatories have been constructed in connection with many of the barracks, and in the new ones now under construction.

Wells, Protection of.—Great attention will be devoted to this great desideratum; at many stations, the ground about the mouths of cisterns and wells has been or is being paved and drained to prevent pollution, and to guard against the spread of guinea worm. Swimming baths, it is hoped, will be universal in all cantonments; where they do exist they are immensely appreciated by officers and men, and are of the greatest importance to their health and comfort in a tropical climate.

Rations.—The composition of the daily ration has undergone no material change during the year, and on the whole the Reports are favourable thereon. As a rule, beef is issued on 6, mutton on 1 day in the week; a little more variety is desirable. The meat is of very fair quality, and the quantity, 1 lb. with bone, is sufficient in my opinion. The bread, as a rule, is excellent, and the other component parts of the ration quite up to what I have seen elsewhere. The quality somewhat varies of course according to season, and to the resources of the station.

Vegetables.—The supply of vegetables has been satisfactory and sufficiently varied.

Cooking.—The means of cooking and the condition of the kitchen vary at some stations. The kitchens are still faulty, being smoky and badly ventilated, and without much facility apparently for varying the diet. At other stations every modern improvement has been brought into play for cooking the rations; but I have, from personal observation and no small experience, considerable doubts whether modern appliances with native cooks will turn out a better dinner for the British soldier than the old style of things did.

Cooks.—The cooks in this Presidency are always Portuguese, and they certainly make the most of the material and of the cooking apparatus, and with a frying-pan and a deckcher or wide-mouthed pot, they manage to prepare the ration as the men fancy it,—boiling, stewing, baking, &c.,—so that, with no great variety of ingredient, the meal is wholesomely varied from day to day.

Smoke.—In all the new kitchens, or modified old ones, considerable attention is being paid to the ventilation, and the standard plan now adopted obviates the smoke nuisance.

Soldiers as Cooks.—I think it would be well worth a trial to employ the men themselves (as at home) to cook, retaining the services in every kitchen of a native as a *stoker*, just to look after the fires. I see no reason why, in most stations at all events, the services of native cooks might not be altogether dispensed with, and their cost appropriated to the purchase of petty stores for the improvement of the daily meal. I am sure the men themselves would be glad of the change, and I would not apprehend injurious effects from the exposure. It would give a good deal of *useful* employment to the men, and that is what they want in this country, I think, more than palatial barracks, institutes, and everlasting drill and parades; moreover, the cooks are the very lowest class of camp followers, always ready and willing to pimp and smuggle in liquor, and the loss of such creatures from a barrack-room is a gain.

Canteens, &c.—The canteen and coffee-shop supplies are favourably commented on by all Medical Officers in the Division. The small stores afforded by these institutions usefully supplement the ration, and they seem, as a rule, to be under very good management at all the stations. Arrack, rum, and malt liquors of good quality are furnished by the commissariat; bottled beer, &c., by contract at the canteens. No unfavourable Report has been made of these articles.

The coffee-shops attached to each regiment and battery are a great comfort and a great boon;—a cup of good coffee or tea can be had at daylight or of an evening, and I am informed that they are very largely resorted to—of a morning especially.

Hospital Diets.—The scale and composition of hospital diets are liberal and sufficiently varied, and a complaint is very rare; and as connected with hospital supplies, and their custody and issue, I may express my regret that the old and valuable class of hospital subordinates, *the Stewards*, have been during the past year supplanted by *Purveyors*.

The former, as a rule, were highly intelligent and trustworthy, able and willing to turn their hands to help in the wards on emergency, liked and trusted by the men and by the Medical Officers, available for apothecary's duty when required, and in their own particular sphere highly useful in looking after the servants, superintending the cooking, and serving out of the rations and medical comforts. I think the change is a loss as regards the comfort and well-working of our hospitals. *Bombay.*

Clothing.—The dress of the troops appears to have been suited to climate and season, care being taken to alter it according to variations in temperature, &c. White clothing worn at all stations during the hot season and in the heat of the day, serge clothing and cloth trousers in the rains and cool seasons; wicker helmets with white quilted covers, and a fold round, in universal wear.

Head Dress.—I think a lighter head dress of felt or cork would be a great improvement for the Infantry. The Royal Artillery wear a felt helmet which is whitened with pipe-clay and glazed with white of egg. It is a good head dress, barring some brass mountings which add to the weight, and I don't think improve the appearance.

Bedding.—In accordance with a Government resolution, a straw mattress and a couple of English blankets have, during the year, been issued to each soldier in place of the old quilt and country blanket. I think a step farther might be taken by substituting coir for straw. It would be cheaper in the end, and is certainly more comfortable and no great luxury after all.

Flannel.—Flannel shirts, if the quality of the material and the washing of it receive due attention, I have always strongly advocated, and they are gradually being adopted. I think their universal adoption would be a vast improvement on the "cholera belt," the name of which is bad enough not to mention other objections.

Belts—Are uncomfortable to wear as they wrinkle up and irritate the skin, and are of no use in protecting the lower part of the belly, especially on the march or on a field-day.

Duty.—There is no evidence of any injury resulting to corps or individuals from excess of work. On the contrary, I agree with most Medical Officers that the men have not had more than enough of parades and drills to keep them in healthful exercise. The average nights in bed have been 5 to 7, very rarely below 4, and if so, enquiry with a view to remedy of the same has invariably been made and attended to.

Early Parades.—Most parades are held early in the morning. I have always been of opinion that very early parades in the hot weather are hurtful; a man requires as long a morning sleep as he can get, to make up for inevitable want of rest in the early hours of the night from heat, musquitoes, and other torments. I think roll-call in barracks of a morning as a rule ought to replace gun fire parades, at all events in the very hot weather.

Amusements.—I believe a good deal is done at most stations to promote the welfare of the men by giving them opportunities of amusing themselves, both at out-door and in-door games. Every regiment has its own way of conducting the same, all depending on the Commanding and other Officers. Cricket, skittles, quoits, fives, long bullets, rounders, and other games, may be seen going on outside every barrack at fitting times. Private theatricals, glee singing, dancing, &c., are in high request in some regiments and very properly encouraged.

Gymnastics.—At Poona there is a regular gymnasium which is pretty well attended, and will be more so by-and-bye under the superintendence of a qualified inspector. There are gymnasia also at Kirkee and Ahmednuggur, but the mounted branch of the Service have but little time for these pursuits, what with stables and harness cleansing.

Gardens—Considerable attention is paid, chiefly I think by the married soldiers, to gardening, and I know of no employment more useful or beneficial to them.

Exhibitions.—There was to have been an exhibition for soldiers' work during the year, but so many regiments were on the move that it did not come off. In 19 cases out of 20 all the money gained at these exhibitions

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goes in drink and dissipation, and I fear the same may be said of the produce of ordinary workshops, and I think most Commanding Officers and Regimental Surgeons would willingly dispense with them on that account.

Particular Stations.—Having in the preceding observations endeavoured to give a general sketch of the Sanitary condition of the force as regards quarters, food, water, &c., during the year, I propose now to deal with each station in the Division by itself.

Poona.—Garrison.—In this large cantonment—the head-quarters of the Division, and for a considerable portion of the year of the Bombay Government and the Army—the constitution of the force has much varied, as will be seen by the following enumeration of the different moves in the course of the year :—

Changes.—On the 1st January, 1868, Poona was garrisoned by the 45th, 96th, and a wing of the 108th Regiment. On the 15th January, the 45th left to embark at Bombay for Abyssinia, sending its depôt to Sattara in March; the 108th wing, to which were attached nearly all the sick, left for Bombay on the 10th March to embark with its head-quarters for Belgaum. The 46th arrived from the Bengal Presidency (Lucknow) on 14th January, and occupied the barracks at Ghoreporie, vacated by the 45th, until departure to embark for England on 30th September; the 1st Battalion 23rd Regiment arrived from Jubbulpore on the 10th January, leaving *en route* a detachment at Asseerghur. They remained under canvas in Poona till the 4th March, when they left for Bombay. On 13th and 16th June, two batteries Royal Artillery, viz., 5th Battery 25th Brigade, and G Battery 14th Brigade arrived from Abyssinia, and were quartered in the Ghoreporie lines; the former left for Bengal Presidency *viâ* Kurrachee on 14th October, the latter for Ahmednuggur on 16th July. On 16th November the 1st Battalion 2nd Queen's arrived from Aden, less 3 companies or detachment at Hyderabad Sind. They have taken the barracks vacated by the 46th. The 1st Battalion 8th Regiment arrived from Malta on 2nd November, and sent a detachment of 280 men to Sattara. They occupy the old Horse Artillery and some temporary barracks at Wanourie.

3rd Hussars arrived from England on 20th December, and are now marching in 3 Divisions to Ahmednuggur to be stationed. The depôt 26th Cameronians arrived from Belgaum on the 29th March and remained till 2nd June, when they proceeded to Bombay to embark for Calcutta. The general depôt has been unusually full during the year, for, besides the ordinary parties of invalids, and time-expired men and recruits, a great number of volunteers from 1st Battalion 4th Regiment, 33rd, and other regiments going home have been attached, waiting for proper season to join their regiments.

Strength, &c.—The average strength of the European portion of the Poona garrison has been 3,243; the percentage of sick 5·23.

Barracks, &c.—The barrack and hospital accommodation has (I find from the records to which I have access) been repeatedly described. Dr. Currie, C.B., Inspector-General of Hospitals, has, in the Army Medical Blue Book for 1865, gone very fully into details on these matters regarding some of the principal stations of the Bombay army, including *Poona* and *Kirkee*. I shall, in dealing with these two stations, merely advert to the improvements and alterations completed or in hand during the year.

New Barracks.—Six new upper-storied barracks have been commenced at Wanourie; they are to accommodate eventually 240 men in all, and are being constructed on the Bengal standard plan, modified to suit the Western Presidency. Cook houses, lavatories, latrines, and all subsidiary buildings, with the latest improvements are to be added, and the cook rooms are to have ovens, boilers, &c. When these new barracks are handed over, the temporary barracks now under occupation will be given up, and Poona will contain, it is to be hoped, only 2 European regiments. The site for a third is under survey beyond Kirkee, and the general depôt will be moved to Deolallee.

Improvements.—The family quarters at the south end of cantonments have been paved throughout, and their ventilation improved.

Lavatories.—The lavatories throughout the Wanourie lines were early in the year fitted with Jennings' patent ranges and shower baths. Each company has now a room containing 16 hand basins, 16 foot pans; 4 shower baths, and 2 small rooms for private ablution. The water is supplied from outside by gravitation. New quarters and subsidiary buildings for the hospital sergeant at the Right Plank Barracks, Wanourie, have been erected, and a temporary guard room at the same hospital, to replace the present confined and badly ventilated one, is about to be built. *Bombay.*

Cook Rooms, &c.—Additional cook house accommodation has been provided in the old Royal Horse Artillery lines at Wanourie, by the erection of a large temporary cook room much required, and in the same lines a range of 6 solitary cells is in a forward state. These are to be paved, and shaded by a wide verandah roof.

Earth Sheds.—Sheds for storing earth, in connection with dry conservancy, have been erected at 2 barrack ranges.

Arsenal Guard.—A spacious guard room, with lavatory, latrine, &c., on the standard plan, has been finished, and recently occupied by the Arsenal guard; and a similar structure is proposed for the Treasury guard.

Government Bakery.—Some very extensive additions have been made to the Government bakery, so as to afford increased facilities for the supply of good bread to the troops in cantonments, and biscuit for their use at sea or elsewhere.

Native Latrine.—A latrine for native servants at the General Depôt Hospital is now being constructed. This has long been a desideratum and frequently insisted upon.

General Depôt Hospital.—Various minor improvements have been suggested in connection with the last-named hospital, but as it is apparently decided that the depôt is to be established elsewhere, these works are in abeyance, except that an objectionable cesspool in connection with the kitchen has been abolished, and that the sergeants' quarters have been much improved.

A new female hospital, with matron's and medical subordinates' quarters, is urgently needed at the General Depôt, and subordinates' quarters at the Left Plank Hospital, Wanourie.

By far the most important fact, as bearing on the health of the whole population of Poona city and cantonment, is the commencement of an extensive water supply system, some seven miles south of the station towards the Singhur range of hills. A great reservoir is to be constructed, whence water will be brought by canal and then by pipes to every house and barrack in the station. The water supply has always been unsatisfactory, both as to source, quality, and quantity; and the works when completed will be an inestimable boon to all. The monsoon set in earlier than usual in 1868, and the tanks, &c., were soon full; but usually the supply of water is precarious, and there has never been sufficient for the purpose of laying the dust in the many miles of road intersecting the station, and for other most desirable purposes.

There has not during the year been any real want of room for the troops, although some of the barrack accommodation is decidedly bad in all respects. I consider the barracks at Ghoreporie to be the most comfortable, although they are very far removed from the standard plan. They are somewhat too close together and not sufficiently raised, but are in other respects good, and they have proved healthy. The married quarters are also very good, and the hospital in every respect comfortable.

Wanourie Lines, 96th Regiment.—The Wanourie barracks have been occupied throughout the year by the 96th Regiment, minus a detachment at Neemuch. They are double-storied, both floors being occupied, there being no day rooms as in the new upper-storied barracks. The men complain of the upper rooms being hot; this might be improved by constructing a verandah and balcony to the south and west.

Left Plank Barracks, 1st Battalion, 8th Regiment.—The 1st Battalion, 8th Regiment, are quartered partly in the old Horse Artillery lines to the east, and close to the last-named barracks, and partly in temporary barracks near the race-course (they have a strong detachment at Sattara). These quarters are not comfortable; most of the rooms are badly ventilated and floored, and in

Bombay. too close proximity; the guard room is too small and many of the out-houses are inferior.

Hospital too small.—Added to which, the hospital assigned to this regiment is totally inadequate to its requirements in the hot weather, being a small building with 14 beds, originally intended for a troop hospital, Royal Artillery. To supplement this, tents have been pitched and thatched over, and this answers well enough in the cool season, but will of course not suffice in the hot and rainy seasons. When the 108th Regiment occupied these barracks, a large upper-storied range had to be given up for the reception of their numerous sick, an objectionable plan but the only resource.

Three European Regiments at Poona, one too many.—It is well known that there is only proper accommodation in Poona for 2 entire regiments, and it is much to be regretted that it is intended to quarter 3 here during the coming year. Room may be made for all the men by taking away day rooms and utilizing buildings condemned 20 years ago; and no deficiency of space may appear on paper, but the men will be crowded for all that, and cannot be comfortable; and some other provision must be made for the 3rd Regiment's sick, either by doubling-up the sick of 2 regiments, or occupying a barrack as an hospital.

General Depôt.—The general depôt buildings are of very inferior description in all respects; the barracks are huddled together, badly roofed, ventilated, and paved, verandah-less and most uncomfortable. At the height of the invaliding season a number of the men have to occupy tents. These barracks have years ago been condemned as "unfit for occupancy by Europeans." As before said, there is now a prospect of their being abandoned, in which case the hospital will be available for the sick of the 3rd Regiment; and nothing on the score of hospital accommodation will then be wanting, as it will be proposed to give up the small hospital at Wanourie, now held by the 1st Battalion, 8th Regiment, for the reception of cases of small-pox and other contagious fevers.

Contagious Cases, Hospital for.—No such institution exists for this large garrison, and it is time there should be some better provision for these cases than that afforded by pitching a tent outside the hospital compound—the only course to be adopted, as none of the hospitals have proper wards for isolation purposes.

Lock Hospital.—Another great want for Poona is the establishment of a Lock Hospital. The "Cantonment Act" has ordained such an institution for all stations, but as yet it is in abeyance for want of a Government grant of money, it is believed. Close to a large native city, with extensive bazaars full of prostitutes, there is of course a considerable amount of enthetic disease among the men, although it is not so bad in this respect as some other stations in the Command. Still, when the Tables show 412 cases of venereal among the European force at Poona, being above 12 per cent. on the strength, it is surely expedient that the "Contagious Diseases Act" should be enforced as well as promulgated in India. The other stations in the Division would show similar averages.

Kirkee.—Kirkee is exclusively a Royal Artillery station, and has been occupied during the year as follows:—

Force.—For the whole time, head-quarters and A Battery, Royal Horse Artillery, and D Battery, 18th Brigade; on the 10th November, C Battery, Royal Horse Artillery, left for Hydrabad Sind; and on 16th November, 5th Battery, 5th Brigade left for Madras Presidency. The B Battery, Royal Horse Artillery arrived from Ahmednuggur on 1st December.

Strength, &c.—The average strength was 502; the percentage of sick 4·70; the percentage of deaths 2 39; the average daily sick 23·6.

The fullest information having been given by Dr. Currie on all points connected with the sanitary condition of this station in the Report already alluded to, I shall merely notice the alterations and improvements effected or being carried out, and these have been important.

Improvements: New Barracks.—Six old thatched barracks have been removed to make way for the upper-storied ones now in course of construction; of these, it is expected 2 will be handed over for occupancy by April 1st, and 3 more after the rains the remaining 2 have just been commenced.

One of the new single-storied barracks being considered unsafe has been taken down. *Bombay.*

Guard Room.—A spacious new guard room, with lock-up room, range of cells, and provost-serjeant's quarters have been finished and are occupied. This block of buildings has excellent latrines and lavatories, but water is not as yet laid on.

Canteen.—A new canteen is in course of construction, and a new range of staff-sergeant's quarters.

When these new barracks are finished, the accommodation will be superb. According to the plan, each building is intended to hold 42 men; there will be dormitories, upstairs and below day rooms, dining rooms, workshops, &c. It would be premature to enter into further particulars. The new church has been finished, and the rubbish and *débris* left by the workmen is now being removed. Two new roads have been made through the station.

Conservancy.—The old manure pits have been removed, and new ones at a proper distance from barracks have been constructed; and the large latrine for natives, which was situated in front of the horse lines, has been closed and 2 others built to leeward of cantonments.

Water.—The water supply at Kirkee has always been scanty and precarious, and during the past hot and dry season has been barely sufficient for ordinary wants; a private well at considerable distance had to be rented to supplement it. River water was not used at all. It is hoped that there will not for the future be any ground of complaint as to the water supply, as pipes have been laid down for a considerable part of the distance between cantonment and a tank beyond the new Government House.

Hospital.—The hospital, which affords very good accommodation, has had several minor improvements effected, chiefly to the outside buildings, latrines, and bath and cook rooms.

Health.—Kirkee ought to be a healthy station, judging from position and other apparent advantages; but it has been remarked as furnishing annually some bad fever cases, and the past year has been no exception.

Details: Recruits.—I find there were 308 admissions by miasmatic disease with 9 deaths. Quotidian ague furnished 218 cases and 2 deaths, above half of which occurred in the A Battery, E Brigade, which battery alone received recruits from England and they arrived far too late in the season, besides being weakly men. This battery lost the 2 men by intermittent fever, besides 1 by remittent fever, cholera, and dysentery respectively. The other batteries suffered much less in proportion from all causes.

Old Soldiers.—Thus the D Battery, 18th Brigade, who have been 3 years at the station and are mainly composed of old soldiers, were remarkably healthy, furnishing but 13 cases of fever and but 1 death, and that by cholera. I have no doubt whatever that recruits are sent out to India, not only too young, but often too late in the season. They ought to arrive so as to have an entire cold season before them, and should moreover be more carefully selected. The recruits for the Royal Artillery and the 96th Regiment furnished a large proportionate quota of the sickness, and of the mortality and invaliding, during the year in their respective corps.

Sanitation.—Every attention was paid to the sanitary condition of the neighbourhood of barracks—no very easy matter, hundreds of native workmen being employed at the new buildings, whose habits are somewhat opposed to the modern system of sanitation. The engineer has, however, at last been moved to erect temporary latrines for his workmen.

Cholera.—Cholera visited Kirkee after the rains: the first case occurred on 5th September, the last on 6th November. There was a case a day on 5th, 9th, 12th, and 15th September; after which a lull, and none till 30th October, although the native followers and the bazaar people had some cases at intervals. There were then 2 cases (both fatal) on 5th November, and the last case on the 6th. The origin of the visitation is obscure; there was no cholera in the neighbourhood, and the sanitary condition of the quarters and vicinity was very carefully looked to in anticipation of an outbreak, as there had been a few dropping cases among the camp followers and native stable attendants. The huts and quarters of these people were carefully cleansed and fumigated, vacated and closed; and all precautionary measures were adopted with a view

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to stop the progress of the disease, as it appeared among the natives and the European force in the station.

Venereal.—The want of a Lock Hospital at Kirkee may be shown by the admissions of 105 venereal cases during the year, and the invaliding of 7 men from secondary affections.

Ahmednuggur; Topography, Climate, &c.—Ahmednuggur, formerly the head quarters of the Bombay Artillery, has of late been chiefly a Cavalry station. It is distant by road, *viâ* Seroor, 75 miles from Poona, and from Dhoud, a station on the Great Indian Peninsula Railway, 45 miles. It is 1,900 feet below sea-level, and distant from the coast, in a direct line, about 126 miles, consequently within the influence of the south-west monsoon, which is, however, mild in its effects. It is situated on the table-land of the Deccan, bare and undulating, although the cantonment itself is prettily wooded, and the climate partakes of the usual hot and dry character of this region. The rain fall for 1868 was 8 inches below the average, or only 17·5 inches. The prevailing winds were south and south-west. The soil is black cotton, overlaying teap-rock. Average strength, 452; percentage of sickness, 5·94; percentage of deaths, 1·33.

Force.—The occupancy of the station by European troops during the year has been as follows:—On the 1st January were only the Left Wing 3rd Dragoon Guards, and B Battery E Brigade Royal Horse Artillery, the head-quarters wing of the former having just departed for Abyssinia. The left wing followed them to England at the close of the expedition on 22nd May, leaving about 30 volunteers; to these were added a few more from the head-quarter wing subsequently.

The G Battery 14th Brigade Royal Artillery arrived from Poona on the 21st July and remain; and the B Battery, E Brigade, Royal Horse Artillery marched for Kirkee on the 23rd November. The 3rd Hussars are now on the march to the station direct from England.

Quarters, &c.—The Cavalry Barracks occupy a good site, and consist of a double line of 12 blocks;—unobjectionable, except that they are built too close together one behind another, so as to interfere with perfect perflation. The ventilation and general construction are very good, as are the out-houses and subsidiary buildings.

Lavatories.—Detached lavatories are talked of, the existing ones, which occupy a portion of one of the end-verandahs of each barrack, being considered from situation objectionable.

Guard Room, &c.—The guard room, lock-up, cells, are new and excellent in every way; the cook rooms the same, on the modern standard plan.

Patcherries.—Some of the married quarters, which are usually allotted to Royal Artillery families, are inferior, but are to be replaced by better.

Conservancy.—The conservancy of the barracks, and general condition of the neighbourhood, are very well looked to. The latrines are good.

Rations.—The rations and all other supplies for the use of the troops have given satisfaction.

Water.—The quality and source of the water supply have been the subject of some discussion, as possibly bearing on an outbreak of cholera in barracks and bazaars, &c., during August. The water used by the troops for drinking purposes is derived from reservoirs some miles off, whence conveyed by conduits. The main supply is by the Bhingar aqueduct, so-called from its passing through the village of Bhingar and the Sudar bazaar, and is doubtless polluted by sewage.

Improvement of Supply of Water.—It was accordingly recommended that the portion of the aqueduct passing through these localities shou'd be laid down with iron pipes, and there is reason to believe that this plan, the necessity for which was strongly urged, will be carried out.

Accommodation.—The troops have, of course, had far above the regulation allowance of space throughout the year, as the garrison was much reduced in strength.

New Royal Artillery Barracks.—Spacious barracks are being built on the modern standard plan for the Battery Royal Artillery, on an excellent site to the north-west of the Dragoon lines.

Hospitals.—The Dragoon hospital is sufficiently commodious, but it is in some respects faulty in construction, and it is too much hemmed in by other

buildings and dead walls. These drawbacks having been brought to notice will, it is hoped, be remedied; the Royal Artillery hospital is on the whole a much better one, and has of late been further improved in several details. New ablution room is about to be built, and a ward used for isolated cases is to be paved, and its sub-dividing walls removed. *Bombay.*

General Health of Troops.—The general health of the troops has really been good, notwithstanding rather a large number of admissions, but I find that a great proportion were for trivial ailments. Ague caused 58 admissions, and venereal 70, in the B Battery, E Brigade, during the year. The percentage of sick in this battery was 10 to 6 in the wing 3rd Dragoon Guards. This wing lost 2 men by delirium tremens.

Intemperance.—The G Battery, 14th Brigade, reached the station on the 21st July, and but for the effects of intemperance would have shown a very good bill of health. As it was, in consequence of the large amount of money told out to the men by Kirwie prize money, batta, &c., there was a great deal of drinking, which had its due effect in raising the sick list.

Cholera.—Cholera had been for some weeks somewhat prevalent in the district, and I believe in the native city, before its appearance in cantonments or bazaars, so the authorities were in a measure prepared for it. The first case reported among the military was on the 31st July, a child, which terminated fatally; as did the next, an officer's child, on the 4th August. A man of the battery was seized on the 13th, and 2 others on the 17th, the last case occurring on the 26th August. Many cases occurred during this time in the Sudder bazaar, and in the adjoining village of Bhingar, but none at the other end of cantonment, or among the Sepoy regiments. While the disease hovered about, great attention was paid to the sanitary condition of barracks and neighbourhood, in the way of frequent and careful inspection of quarters and natives' dwellings; disinfecting latrines, and general conservancy. Early treat- of slight ailments was insisted on, and the men were as much as possible kept out of bazaars, &c.; happily the disease did not assume an epidemic form although the cases were severe, and the mortality of all classes seems to have been above 50 per cent.

Sanitarium of Salabat Khan's Tomb.—Attached to the cantonment of Ahmednuggur, and distant about 7 miles, is the sanitarium of Salabat Khan's tomb, occupied by convalescent er weakly men during the hot months. It is a large native tomb, mosque-fashioned or domed, adapted as a barrack by building walls across so as to block some of the arched galleries of which the building chiefly consisted internally. The basement floor of the building thus partitioned off accommodates 2 officers and some married non-commissioned officers in the north and east, and south and west sides respectively. The upper floor or gallery is undivided and is meant to hold about 60 men, and is opened to the central shaft. The ventilation and internal arrangements are very good, and it affords a comfortable lodging for the men. The place is considerably more elevated than the adjoining cantonment, being situated on a hill to which there is a fair driving ground. It is a pleasant change for the men, who have no duty and nearly every night in bed. The temperature is about 6 degrees lower than below.

The place has been of late considerably improved, and more is being now done to render it more comfortable for the reception of weakly men next season. New latrines and lavatories are in course of construction, and a new cook room has been finished. The rations come out from the station daily, the water, of excellent quality, from the aqueduct at the foot of the hill. The sanitary condition of the establishment is excellent, as it is perfectly isolated and out of the way of native villages, &c. There is no special hospital accommodation; patients are not sent out for treatment, and any cases of sickness occurring would be sent to the regimental hospital at Ahmednuggur; but it has been suggested, that a small space be told off on the basement floor as a ward, with surgery attached, for such men as may be too weakly to be going up and down the flight of steps to the upper gallery.

Sholapore.—Sholapore is distant from Poona 170 miles by rail in a south-easterly direction.

Topography, &c.—It is a bare and cheerless-looking station, hot and dry even for the Deccan, and more than usually so last year. The elevation is

Bombay. 1,800 feet above sea-level; the soil is the usual black cotton with teap rocks, and much intersected with nullahs.

Climate.—The average rain-fall 30 inches; the winds light and variable, so that khus-khus tatties, which are generally in use from March 15th to June, are but of little benefit.

Force.—The European force during the year has been a battery of Royal Artillery, the E Battery, 18th Brigade, which has been already 3 years at the station.

Strength, &c.—Average strength.... 124

Sick rate	9·3
Death	·8

Quarters.—The site of the barracks is the best available, being open and well-raised, facing the north. They comprize three new or permanent buildings and one temporary; the former are brick and lime, the latter (recently added to give the regulation space to the inmates) of mud and bamboo structure. They are suitably raised on plinths, have good wide verandahs, and are straw-thatched and mud floored. The ventilation is good by edge openings, and opposite doors and windows. The accommodation is sufficient for strength.

Lavatories.—Excellent new detached lavatories have been opened during the year.

Conservancy.—The latrines and urinals are good and carefully looked to, and the general conservancy of barracks and vicinity strictly carried out.

Patcherries.—The married quarters are as bad as possible, but need not be further alluded to, as they are about to be replaced by new and commodious ones already in hand.

Guard Room.—The guard room is too small, and the lock-up is often overcrowded; to supplement the space a tent has to be pitched.

Hospital.—The hospital is a very good one, commodious and well-ventilated, but deficient in quarters for the serjeant and matron; but these defects are about to be remedied, and a new latrine and lavatory for the female ward is being built.

Rations.—The rations are favourably reported on. The water supply good and sufficient.

Health.—The general health of the battery was indifferent; the ratio of sickness 9 per cent., mainly due to the extreme prevalence of intermittent fever.

Fever, Prevalence of.—Assistant-Surgeon Drew, in his excellent Annual Report, has drawn particular attention to the evil results incident to the existence of a considerable tract of marshy ground in the very centre of cantonments, and to expediency of its being drained. He points to the admissions into hospital from the battery from malarious fever, having been in the ratio of 134 per cent. of strength, and 58 per cent. of total admissions. I find that these cases were not, as might be expected, more prevalent during the rainy season, but pretty uniformly distributed throughout the year, thus showing a permanent exciting cause—the marsh referred to. The type of the fever is usually quotidian and marked by much hepatic derangement, and the pretty constant high temperature of the station will fully account for this. Excepting from fever the battery suffered little, and had only 1 death by fever, and lost only 1 child by renal disease. Cholera prevailed in the surrounding district, but happily did not enter cantonment. The exemption from enthetic disease is remarkable, there having been but 1 case of syphilis, and 5 of gonorrhœa during the year.

Sattara.—Sattara is distant from Poona by good road 68 miles, and due south from it.

Topography, &c.—It is about 2,300 feet above sea-level, and distant from it in a direct line about 50 miles. It is a pretty and well-wooded station, partly enclosed by hills, and chiefly built on the slope of one near the junction of two considerable rivers. The geological formation is teap, the soil being black cotton towards the rivers.

Climate.—The climate is hot and dry during the proper season, but for the rest of the year is said to be agreeable, cool, and pleasant, although not bracing.

During the early part of the year the united depôts of several regiments in Abyssinia (nearly all women and children) were located there. Then for some

months it was vacant, till quite recently, it has been occupied by 4 companies of the 1st Battalion, 8th Regiment, from Poona. *Bombay.*

Quarters.—The troops are lodged either in cantonments, or at the port several miles distant. The barracks in cantonment consist of four permanent and one temporary buildings. The former are detached, well raised, brick and mortar built, tiled roofs and flagged floors, and are well ventilated by ridge openings, and opposite windows and doors somewhat varying in arrangement. There are good verandahs all round.

Lavatories, &c.—The lavatories are detached and connected by a covered way; each has its shower-bath, and there is a capital swimming-bath close by. The latrines are on the standard plan.

Kitchens.—The cook rooms also good. The vicinity of these barracks is in good order; the drainage speedy and efficient.

The temporary barrack is a spacious building on the usual plan. It is not so well situated as those just described, the soil being more retentive and the drainage not so good; but it is otherwise an excellent building, well raised and ventilated; the roof is thatch, the floor rammed earth. It is meant to hold 40 men, namely, 20 at each end room, leaving the centre portion for a day room; but circumstances did not admit of this allotment during the past year, and the whole three rooms have served as dormitories.

Guard Rooms, &c.—The guard room and four cells are under one roof; the former is a cheerless room, badly lighted, and is too small for the strength of the guard, giving only 60 superficial and 900 cubic feet per man.

Patcherries.—The married quarters consist of a block for 24 families, each having a front and back room; they are well situated, and in every respect comfortable, with good subsidiary buildings.

Hospital.—The hospital is well situated, and will accommodate 14 or even 20 at a pressure. During the occupation of Sattara by the families of the Abyssinian regiments, it was given up entirely to women and children, many of whom were suffering from ophthalmia and measles.

Hired Bungalow.—A private house was rented for the male patients. This temporary arrangement was satisfactory, but it is evidently expedient that regular female hospital ward should be built.

Fort Quarters.—The Hill-Fort is distant from cantonment 4 miles by a winding-path, and is 1,000 feet above it. It at present gives accommodation to 1 strong company or 70 men.

The building occupied by the troops is of native construction and was formerly a palace. It is two-storied, and is so sub-divided and cut up by archways and passages into small rooms that a description is hardly possible. There are 12 rooms in all, large and small, on the two floors, one below has been given up as a day room. It is badly ventilated according to modern views, but from the exposed site and free circulation of air, I am not aware that there is any good reason for complaint on this score.

Out-Houses.—The kitchens, latrines, and lavatories are of good construction, and there is a good swimming bath.

Water.—The drinking water excellent and abundant, being better than that in cantonments, which is said to be hard. It is derived from wells.

Rations.—The rations, both bread and meat, were in the early part of the year of an inferior description, but after a little trouble and proper representation, a great improvement was reported. The vegetable supply is good and varied.

General Health.—It is hardly possible to judge of the healthiness of Sattara, during the past year, and statistics in this case would not give a correct impression. The detachment 1st Battalion, 8th King's Regiment, have been quartered there a month, and are remarkably healthy. During the early part of the year, the place was occupied by some weakly men and invalids of the 1st Battalion 4th Regiment, 33rd, and 45th Regiments, and all their women and children. All the barracks were given up to the families, and made suitable for that purpose by being partitioned off. Each occupant had as nearly as possible the regulated space, and there was no over-crowding; but, when the families of 33rd Regiment arrived from Kurrachee in April, a couple of private houses had to be hired and fitted up for them by partitioning the rooms. About this time there were 128 women and over 200 children.

Bombay.

Epidemics, Ophthalmia, and Measles.—Ophthalmia prevailed to a very considerable extent among the families, giving a total of 12 admissions among the women and 41 among the children. By early treatment and the strictest attention to cleanliness, and keeping the cases as far as possible apart from the other children, it was stamped out eventually. Measles also broke out, or was I believe imported from Poona, and attacked 19 children, with six deaths. There were also two deaths by convulsion, and two by anæmia among the children; a great number of whom were unhealthy and without stamina.

Women were allowed three-quarters, and children one-half rations, and every possible attention was paid to their comfort and welfare; but I think on all possible grounds it is most injudicious to cram a lot of women and children into one station, and though those at Sattara escaped much of the sickness and mortality usually experienced under the circumstances, still they had more than enough of both to prove it to have been a false step.

Asseerghur.—The hill fortress of Asseerghur occupies the summit of a detached hill abruptly rising from the plains of Khandeish about 800 feet, being nearly 2,000 feet above the sea level.

Topography, &c.—It is six miles over a bad road from the railway station of Chandnee on the Bombay and Nagpore line. The summit of the hill is about 1,000 yards by 600 in dimensions, the approach by a winding and difficult road from the town of the same name at the foot. A new road is being constructed. The surrounding country for many miles is tree jungle, thinly populated, and said to be very unhealthy from fever.

Climate.—The rainy and cold season climate is very pleasant without being bracing. In the hot months the climate is trying, but there is generally a breeze; rain 25 inches.

Force.—The fortress has been garrisoned during the year by a detachment 1st Battalion 23rd Fusiliers.

Average strength	131·48
„ sick rate	4·49
„ death rate....	0·76

The total of admissions have been 208. The station has been proved very healthy. Most of the sickness has been from fever chiefly of intermittent form and mild type, and four rheumatic and catarrhal affections.

Barracks.—The quarters occupied by the detachment consist of two new barracks and a native musjid: the former are on the new standard plan, well situated and raised, efficiently ventilated, tile-cooped and paved.

They have afforded excellent accommodation with the regulated cubic and superficial space per man. The musjid barrack is low and not well ventilated. It is a good deal cut up by archways, &c., into small rooms. There has been an excess of superficial area, but a deficiency in cubic feet per occupant. The situation of the building however, exposed as it is to every breeze, makes this less injurious than might be supposed. In fact, the inmates in this and former seasons have been quite as healthy as in the new barracks, to which the men prefer it as having more ground space, and as the walls and roof are very thick I believe it is cooler.

Conservancy.—The latrines, urinals, wash-houses, &c., are in good order and well looked after. The conservancy arrangements are somewhat faulty, inasmuch as the latrine and other refuse is thrown over the south rampart on to the scarp. It has been proposed to have this remedied by erecting a crane jutting out from a bridge or platform, so as to deposit the impurities far over the rock. Sundry improvements have been quite recently made to the lavatories, and the water supply for them has been ample.

Water, &c.—The water is obtained from wells and tanks of excellent quality. Three new wells are in course of formation. The drainage is natural and speedy, and the general sanitary condition of barracks and vicinity satisfactory.

Guard Rooms, &c.—There are two guard rooms, the main and the quarter. They are somewhat cramped in dimensions, but improvements are promised.

Patcherries.—The married quarters are now being improved in various details.

Rations.—The rations have been very good, and the condition of the kitchens satisfactory.

Dress and Duty.—The dress and duties of the men have been as at other stations, and call for no special remark. *Bombay.*

The place is monotonous, and the means for out-door amusements very limited. The ball-alley is quite out of repair, and the skittle ground was useless from want of gear; there is, however, a fair cricket-ground. During the cool months a large portion of the men have found employment in making a new or gun road from the foot of the hill, which has, it is reported, been very conducive to their health.

Hospital.—The hospital is a large native building, once a palace, somewhat modernized. It is well situated on rising ground, midway between the two sets of barracks. The ventilation, &c., is good, and the accommodation ample for all requirements. There is one spacious ward and several smaller ones. The subsidiary buildings are in a satisfactory condition; the lavatory has of late been improved by having an iron pipe laid to carry off the waste water. A dead-house is now being built.

Poorundhur.—Poorundhur, the principal military sanitarium of the Presidency, is distant from Poona by a good carriage road, 24 miles.

Topography, &c.—The elevation is 4,470 feet above sea-level, and 2,500 above the plain of Poona, but only about 1,000 feet above the adjacent country, from which the ascent is by a tolerable bridle road. The station occupies a piece of terraced land on the north slope of the hill.

Barracks, &c.—The barracks are at the eastern, and the hospital at the western spur of the hill, the distance betwixt the two points being about three-quarters of a mile by an excellent road, above and below which are officers' and other houses, family quarters, church, and a few shops. There is a good walking road round the Poorundhur hill about $3\frac{3}{4}$ miles, and another round the adjacent hill of Wuzeerghur, 3 miles. Towering above the former is the upper port, containing now only two or three dismantled houses.

The sanitarium was established in 1852, and its importance in giving a salutary change of air and scene to soldiers and their families, during the hot weather chiefly, is fully bore out.

Climate.—The climate partakes much of that of the plains below; the thermometer rising in April and May above 90 degrees, but the mornings and evenings are always even then cool and invigorating. The monsoon commences early in June, and for several months the whole hill is enveloped in cloud, but the rain-fall is moderate. During the past year, I observe, rain fell on 103 days marking 44 inches. The force and volume of the monsoon is intercepted by the Mahableshwur range to the south-west, so that it is quite habitable all the year round, unlike the neighbouring hill stations where the rain-fall is often three and four times as great, but as a rule it does not present sufficient superiority over the climate of Poona, Kirkee, &c., during the rainy season, to necessitate the detention of other than special cases after the early part of June.

The Poorundhur season therefore corresponds to the hot season on the plains, or from March to June, or the commencement of the rains. During this portion of the year, the sanitarium is full. A few men only are detained during the rains, and special cases are from time to time sent up for the benefit of change during the other months.

Accommodation.—The accommodation afforded by barracks and married quarters is for 127 men, including 32 hospital beds, but this is often supplemented by tents pitched near barracks and hospital as sleeping quarters, their occupants living in barracks during the day.

Last year the sanitarium during the season was pretty full, and as an average *for the year* would convey no true statistical information, I shall not give it. All the men are of course weakly, and of these, not actually under hospital treatment, a considerable proportion attend daily as convalescents.

From the Medical Officer's Report, I find that 150 men were sent to the sanitarium during the past year, plus 24 remaining from the previous year. Of these 100 returned to duty, and 25 were sent down to rejoin their regiments leaving the Presidency, eight left to appear before the Annual Invaliding Committee, and 19 were sent down as unsuitable cases, or who, it was thought, would not profit by a further residence on the hill; one man died (phthisis), and 21 remain at the sanitarium.

Bombay.

The total of cases treated in hospital was 120. There were 16 women with 23 children, who gave respectively 6 and 10 admissions.

The proportion of zymotic to all other diseases was 85 to 35.

Suitable Cases.—The chief admissions were for relapses of fever contracted on the plains and for anæmia and general debility, and these cases as a rule do remarkably well. Rheumatic and syphilitic cases as a rule do not improve, and organic lesions of important organs certainly do not. Still, I think, the sending of even such cases to the comparatively cool breezes of Poorundhur from such hot stations as Sholapore, Poona, or Kirkee, is quite excusable. The patients would in most instances have retrograded in the plains.

Healthiness.—The station *per se* was healthy during the past year. A few cases of measles appeared among the children late in the season, and there were three slight cases of erysipelas in hospital.

Cholera was somewhat prevalent in the native villages below, but it did not reach the hill.

Barracks, &c.—The barracks are situated on the eastern extremity of the hill. They are four in number (or rather were, for one has been pulled down being pronounced unsafe), substantially built of stone and lime, with tiled roofs and paved floors. There is a good enclosed verandah all round, and non-commissioned officers occupy the small-end rooms. A new barrack on the site of the old one is about to be built, and the site for additional barracks is under survey.

Ventilation, Warming, &c.—The ventilation of the quarters is excellent by means of cowls, honey-comb openings opposite doors and windows, and a chimney shaft used for the fire-places during the rainy season. Stoves have been recommended in place of them, to be put up two in each room at equal distances, and I believe these are coming out from England.

Conservancy.—The drainage in the vicinity of barracks is natural and speedy, the conservancy arrangements are very good, the latrines on the standard plan and particularly well looked to. New latrines for the bazaar people (male and female) have been completed.

Water.—The water supply is adequate, that for ablution purposes abundant from large tanks. The drinking water is excellent, but apt to fail on the lower hill during the hot months. There is, however, an abundance in the upper part. Three new wells were finished during the year.

Lavatories.—The lavatories are in course of alteration, they have been rather deficient in comfort.

Guard rooms.—There is no guard room, and the two cells close to the barracks were not tenanted during the year, or indeed, I am told, for some years past.

Rations.—The quality of the rations reported good; mutton is issued on five, and beef on two days in the week; the former is slaughtered on the hill, the latter is sent up from Poona. Excellent bread is baked on the spot. The supply of vegetables somewhat deficient in variety, potatoes and onions as a rule, but from April to August, cabbage and pumpkins are issued daily in ration both to barracks and hospital. The canteen regulations are good; porter is only issued to the convalescents.

Clothing.—The clothing worn by the men is carefully adapted to seasonal changes and climate. Each has an additional blanket.

Duty.—They have every night in bed, and no duty except occasionally as orderlies in hospital.

Amusements.—There is a good fives court and a skittle ground, and a tolerable library with the usual in-door games. The men are encouraged to walk round the hills morning and evening.

Patcherries.—The family quarters consist of a range of buildings situated midway between barracks and hospital, and accommodate 10 couples, each family having two good rooms. New latrines have been constructed during the year, connected with the quarters by a covered way; the bath-rooms, kitchens, &c., attached to these quarters are comfortable.

Hospital.—The hospital occupies a good site at the western extremity of the station. It is an excellent and commodious building, faces the west, is well raised and thoroughly ventilated, airy and cheerful. It consists of four wards, 42 by 26 by 14 feet, each giving eight beds. On the west side a spacious

verandah runs the whole length. On the east it is interrupted by two rooms used respectively as surgery and non-commissioned officers' room. The patients dine in the eastern verandah. *Bombay.*

All the subsidiary buildings are in a satisfactory condition. New detached lavatory has been sanctioned to replace the two now in use which occupy corners of the enclosed verandahs.

The female hospital is detached. It is a comfortable and commodious building and has recently been improved by a trellised verandah. The quarters for the hospital serjeant, subordinate medical establishment and hospital servants are very comfortable.

Section II.

On the Extent of Invaliding.

During the year, 2,382 invalids were sent home from India, being in the ratio of 45·04 per 1,000 of mean strength. Of these 1,393 or 42·33 per 1,000 were sent from Bengal, 634 or 62·41 from Madras, and 355 or 36·15 from Bombay. Compared with the results for 1867 this shows a decrease of 3 per 1,000 on the general invaliding. There has been a slight decrease in Bengal and an increase of 8 per 1,000 in Madras, with a corresponding decrease in Bombay. *India.*

Of invalids from India there were 1,097 finally discharged the service at Netley, being in the ratio of 20·74 per 1,000 of the strength, and very slightly in excess of the proportion in the preceding year.

The disabilities on account of which the invalids were sent to England and finally discharged are stated in Abstract No. 26 in the Appendix, from which the following classified summary has been prepared.

India.

Order.	Disabilities of	Invalids sent home from Bengal.	Madras.	Bombay.	Invalids from India discharged the service at Netley.
	Mean Strength	32,909	10,158	9,820	52,887
	Class I.				
1	Miasmatic Diseases—				
	Paroxysmal Fevers ..	72	10	21	14
	Continued „ ..	1	1	..	..
	Dysentery and Diarrhœa	57	90	17	20
	Sorethroat	..	..	1	..
	Ophthalmia	10	2	15	22
	Rheumatism	100	35	27	57
	Carbuncle	..	1	..	..
2	Enthetic Diseases	89	66	37	58
4	Parasitic „	2	..	..	..
	Class II.				
1	Diathetic Diseases ..	66	8	8	9
2	Tubercular „	117	53	29	141
	Class III.				
	Diseases of the—				
1	Nervous System ..	86	48	41	113
2	Circulatory „ ..	145	58	32	219
3	Respiratory „ ..	44	22	10	11
4	Digestive „ ..	240	115	63	145
5	Urinary „ ..	10	5	3	6
6	Reproductive „ ..	8	6	1	7
7	Locomotive „ ..	26	9	3	22
8	Integumentary „ ..	22	10	5	20
	Class IV.				
4	Diseases of Nutrition ..	264	79	27	180
	Class V.				
1	Accidents	34	16	15	50
2	Gunshot wound	..	..	..	2
4	Suicidal wound	..	..	..	1
	Total ..	1,393	634	355	1,097
	Ratio per 1,000 of mean Strength .. 1868	42·33	62·41	36·15	20·74
	Ratio per 1,000 of mean Strength .. 1860-7	37·36	47·18	34·07	17·12

This Table shows that, as in the preceding year, atrophy, resulting from malarious disease, was the most frequent cause of invaliding from Bengal, and that diseases of the digestive system, chiefly hepatic affections, were the most prominent cause in Madras and Bombay. There was a considerable reduction in the discharges from the Service on account of tubercular diseases, which now rank after diseases of the circulatory and digestive systems and of nutrition.

Section III

Mean Daily Sick.

The mean daily sick are shown by the Principal Medical Officers' Returns to have amounted to 1,743 in Bengal, 634 in Madras, and 606 in Bombay, being respectively in the ratio of 52·96, 62·41, and 61·71 per 1,000 of mean

strength. The proportion has been rather higher than in 1867 in Madras, and lower in the other two Presidencies.

On these numbers the calculations in the following Table have been based:—

	Bengal.		Madras.		Bombay.	
	1868.	1860-67.	1868.	1860-67.	1868.	1860-67.
Ratio per 1,000 constantly Sick ..	52·96	64·56	62·41	63·21	61·71	62·19
	Days.	Days.	Days.	Days.	Days.	Days.
Average Sick Time to each Soldier	19·33	23·57	22·78	23·07	22·52	22·70
Average Duration of Cases ..	14·06	13·83	16·28	16·54	20·51	14·49

Compared with the results for the preceding year there has been a very slight increase in the mean sick and average sick time to each soldier in Madras, and a decrease in the other two Presidencies, and there has been an increase in the average duration of the cases in Bombay, while there has been no change in the others in this respect. Compared with the average of the preceding eight years there has been a decrease in the mean daily sick and average sick time to each man in all the Presidencies, well marked in Bengal, but to a slight extent only in the others; while there has been a trifling increase in the average duration of the cases in Bengal, and a considerable one, amounting to six days, in Bombay.

Section IV.

On the Influence of Age on the Mortality.

In Abstract No. 27 in the Appendix, the number of men at each age, in quinquennial periods, in each regiment which served in India throughout the year, is stated, and the deaths in each period of life. The following Table shows the results for each of the Presidencies;—

India.

	Under 20 years.		20 and under 25.		25 and under 30.		30 and under 35.		35 and under 40.		40 and upwards.		
	Strength on 1st January.	Died during Year.	Strength on 1st January.	Died during Year.	Strength on 1st January.	Died during Year.	Strength on 1st January.	Died during Year.	Strength on 1st January.	Died during Year.	Strength on 1st January.	Died during Year.	
Bengal	1,493	22	8,123	132	12,019	200	6,267	181	2,011	82	362	19	
Madras	317	4	2,253	18	3,896	92	1,381	74	595	24	113	8	
Bombay	448	3	1,988	30	2,775	27	2,030	47	671	20	90	5	
Total	2,258	29	12,364	180	18,690	319	10,178	302	3,277	126	565	32	
Ratio of Deaths per 1,000 of Strength ..	12·84		14·56		17·07		29·67		38·45		56·64		
Ratio of Deaths per 1,000 of Strength in— Bengal, 1862–7													
Madras and Bombay, 1861-7 ..	7·68		16·11		24·64		32·18		41·94		56·01		

The increase of mortality with the advance of age is not very marked till after 30, when it advances very rapidly. As we have before observed it is very probable that the regularity in the progression is broken in the third quinquennial period by the operation of the Limited Enlistment Act.

XIV.—ABYSSINIA.

THE medical history of the campaign in Abyssinia was given so fully in the Report by Dr. Currie, the Principal Medical Officer of the Expedition, published in the preceding volume of these Reports, that it appears unnecessary again to enter into the details of the movements of the troops, and the various arrangements which were made to maintain them in health, and to afford needful assistance in cases of sickness. It will be sufficient on the present occasion to place upon record the amount of sickness, mortality, and invaliding which occurred, with the diseases to which these were attributable. The Returns refer only to the European force employed. That force consisted of the 3rd Dragoon Guards, four batteries Royal Artillery, one company Royal Engineers, the 1st Battalion 4th, the 26th, 33rd, and 45th Regiments, and detachments of the Land Transport and Army Hospital Corps. These troops arrived in Abyssinia at various dates between the 4th December, 1867, and the 1st April, 1868; and left the country between the 15th May and 1st June. The aggregate strength was 4,203; the cases of sickness reported were 1,332, and the deaths in Abyssinia 42; to these, however, must be added 12 among the invalids sent to England, making a total of 54. The number of invalids sent to England was 333. The loss by death during the campaign amounted therefore to 12·83, and by invaliding to 79·13, or altogether to 92 per 1,000 of the force disembarked. *Abyssinia.*

As the various corps composing the force served in Abyssinia for different periods, we have reduced the strength of each to an *annual* average, and the sum amounts to 1,494; in other words the strength of these corps, during the periods they were on service in that country, was equal to 1,494 men serving for a whole year. Calculated upon these numbers the annual ratio of admissions was 892, of deaths 36·14, of invalids sent home to England 222·7, and of discharges by invaliding 50·7 per 1,000 of mean strength.

The following Table, framed from Abstract No. 28 in the Appendix, shows the sickness, mortality, and invaliding by classes of diseases:—

Abyssinia.

Orders.	Diseases. (Average *Annual* Strength, 1,494.)	Admissions into Hospital.	Deaths. In Abyssinia.	Deaths. Of Invalids.	Deaths. Total.	Invalids. Sent to England.	Invalids. Discharged at Netley.	Ratio per 1,000 of Average *Annual* Strength. Admitted into Hospital.	Died.	Invalided to England.	Discharged at Netley.
	Class I.										
1	Miasmatic Diseases ..	718	22	7	29	143	16	480·6	19·41	95·7	0·7
2	Enthetic „ ..	125	..	..	..	25	2	83·6	·67	16·7	11·3
3	Dietic „ ..	1	1	..	1	..	..	·7	..	..	..
4	Parasitic „ ..	5	..	..	..	..	..	3·3	..	..	..
	Class II.										
1	Diathetic Diseases ..	5	1	..	1	4	..	3·3	·67	2·7	..
2	Tubercular „ ..	8	..	..	..	11	9	5·4	..	7·4	6·0
	Class III. Diseases of the—										
1	Nervous System ..	17	1	..	1	9	..	11·4	·67	6·0	..
2	Circulatory „ ..	10	1	..	1	9	22	6·7	·67	6·0	14·7
3	Respiratory „ ..	53	..	..	..	22	2	35·5	..	14·7	1·3
4	Digestive „ ..	92	2	2	4	35	9	61·6	2·67	23·4	6·0
5	Urinary „ ..	2	2	..	2	1	2	1·3	1·34	·7	1·3
6	Reproductive „ ..	9	..	..	..	5	..	6·0	..	3·3	..
7	Locomotive „ ..	8	..	..	..	3	..	5·4	..	2·0	..
8	Integumentary „ ..	113	..	..	..	6	1	75·6	..	4·0	·7
	Class IV.										
4	Diseases of Nutrition .	37	..	..	..	42	·8	24·8	..	28·1	5·4
	Class V.										
1	Accidents	111	11	3	14	12	2	74·3	9·37	8·0	1·3
2	Battle..	12	..	..	..	6	3	8·0	..	4·0	2·0
4	Suicide	1	1	..	1	..	..	·7	·67	..	..
6	Corporal Punishment .	4	..	..	..	..	..	2·7	..	..	..
	No appreciable disease	1	..	..	..	..	..	·7	..	..	..
	Total	1,332	42	12	54	333	76	891·6	36·14	222·7	50·7

The admissions into hospital were in the proportion of 892, and the deaths of 36·14 per 1,000 of mean annual strength, but these results were not entirely due to the climate of Abyssinia, or the nature of the service on which the troops were employed; a considerable proportion of both sickness and mortality was clearly the result of the previous service of the men in India. It must be remembered, however, that the period during which the force was in Abyssinia was that which is usually the healthy portion of the year; and that both sickness and mortality would probably have been greatly increased if the troops had been kept in the country during the wet season.

MIASMATIC DISEASES were the cause of more than half the admissions and deaths; the influence of the principal diseases of this class is shown in the following Table:—

Diseases.	Admitted.	Died.	Ratio per 1,000 of Mean Strength.	
			Admitted.	Died.
Eruptive Fevers	..	..	..	..
Paroxysmal „	241	2	161·3	1·33
Continued „	19	1	12·7	·67
Dysentery and Diarrhœa	343	19	229·6	12·72
Sorethroat and Influenza	21	..	14·1	..
Ophthalmia	20	..	13·4	..
Rheumatism	71	..	47·5	..

Paroxysmal Fevers were the cause of one-third of the admissions by miasmatic diseases. Two deaths only occurred, both by the remittent type. The first was that of a private of the 4th Regiment, who died in February on board the hospital ship in Annesley Bay; and the second, that of a sapper of the Royal Engineers, in April at Addigerat.

Dysentery and Diarrhœa gave rise to nearly half the admissions and two-thirds of the deaths by this class of diseases. The total deaths by them amounted to 23, of which four occurred among the invalids. These appeared to be the most prevalent diseases in Abyssinia, and particularly in the highlands. One of the Medical Officers states, that the diarrhœa there very closely resembled the hill diarrhœa of India.

None of the other miasmatic diseases prevailed to any extent among the troops.

Enthetic Diseases.—The admissions by this class amounted to 84 per 1,000; but it is stated that in a considerable number of cases the disease had been contracted in India before embarkation.

Parasitic Diseases.—Among the dangers anticipated to the troops, the prevalence of tapeworm and other intestinal parasites was foretold, and brought prominently under the notice of the authorities. Fortunately these anticipations proved to be unfounded, only three admissions being recorded from tapeworm (*Tænia Solium*), and none from any of the other intestinal worms.

Diseases of the Respiratory Organs furnished 35 admissions per 1,000 of the strength, but no deaths. The cases were chiefly bronchitis, the result of the variations of temperature, with the cold nights in the high lands.

Diseases of the Digestive System caused 62 admissions per 1,000 of the strength; four of the cases, or 2·67 per 1,000 of the strength terminated fatally. Two-thirds of the cases and all the deaths were caused by inflammation of the liver, probably, in most instances, the result of Indian service.

Diseases of the Integumentary System were a cause of considerable inefficiency, the admissions having amounted to 76 per 1,000, chiefly from boils, and abscesses and ulcers.

Accidents and Violence.—The mortality by this class was very high, amounting to upwards of one-fourth of the whole. The high ratio was due to sunstroke or heat-apoplexy, which occasioned 10 deaths in Abyssinia, and 2 among the invalids. The only other deaths in this class were 1 from accidental poisoning by an overdose of chlorodyne, 1 suicidal by fire-arms, and 1 of an invalid accidentally drowned.

Battle.—The admissions into hospital by the casualties of war amounted only to 12, and without any death.

Invaliding.—The proportion of invalids sent home was extremely high, but an examination of Abstract No. 28 in the Appendix will show that this was due rather to the previous Indian service of the men than to Abyssinia. Dysentery and diarrhœa, ague, hepatic disease, and atrophy resulting from malarious disease, were the chief causes of invaliding. The numbers finally discharged at Netley were also high, but the same remarks apply to them;

Abyssinia.

valve disease of heart, hepatic disease, consumption, and atrophy, figure as the chief causes of discharge.

Mean Daily Sick.—The number constantly non-effective from sickness is stated by the Principal Medical Officer to have averaged 72, being in the ratio of 17·11 per 1,000 of the aggregate strength. This low rate is doubtless due to the circumstance that, under the special circumstances of the force, none but urgent cases were taken into hospital.

XV.—ON THE HEALTH OF TROOPS ON BOARD SHIP.

STATISTICAL REPORT.

The Ship Returns for the year show the following numbers of troops to have embarked. *Troops on Board Ship.*

I.	Troops or drafts proceeding on foreign service	16,063
II.	Do. returning from foreign service	10,567
III.	Do. passing by sea from one colony to another, or from one station in a military Command to another	12,708
IV.	Invalids and "time-expired men" returning to England	5,599

The number of invalids actually embarked was 3,033, but it has been necessary to include with them 1,706 time-expired men and 860 effectives who were embarked with them and whom it has been found impossible to account for separately.

I. Troops proceeding on Foreign Service.

The number of men shown by the returns to have embarked for foreign stations during the year was 16,063, representing an average *annual* strength of 1,630. There were 1,081 admissions on the sick list and 7 deaths during the voyages, being in the ratio of 663 and 4·29 per 1,000 of mean *annual* strength.

The following Table framed from Abstract No. 29 in the Appendix shows the admissions and deaths by classes of diseases among the troops proceeding to the different foreign stations :—

Troops on Board Ship.

Stations	To Mediterranean and British America.				To West Indies and Cape of Good Hope.				To India, *vid* the Cape.				To India *vid* Egypt.			
Number of men Embarked	6,439				860				2,581				6,183			
Average *Annual* Strength	211				148				678				593			
Order. Diseases.	Admitted.	Died.	Ratio per 1,000. Admitted.	Ratio per 1,000. Died.	Admitted.	Died.	Ratio per 1,000. Admitted.	Ratio per 1,000. Died.	Admitted.	Died.	Ratio per 1,000. Admitted.	Ratio per 1,000. Died.	Admitted.	Died.	Ratio per 1,000 Admitted.	Ratio per 1,000 Died.
Class I.																
1 Miasmatic Diseases ...	20	...	94·8	...	8	...	54·1	...	105	1	154·9	1·48	75	...	126·5	...
2 Enthetic ,, ...	70	...	331·8	...	25	...	168·9	...	171	...	252·2	...	150	...	253·0	...
3 Dietic ,, ...	...	...	...	...	...	...	...	...	1	...	1·5	...	...	...	...	...
4 Parasitic ,, ...	4	...	19·0	...	...	...	...	...	5	...	7·4	...	14	...	23·6	...
Class II.																
1 Diathetic Diseases ...	...	...	...	...	...	...	...	...	6	...	8·8	...	3	...	5·1	...
2 Tubercular ,, ...	...	...	...	...	1	...	6·7	...	3	2	4·4	2·94	9	...	15·2	...
Class III. Diseases of the—																
1 Nervous System ...	1	...	4·7	...	1	...	6·7	...	32	...	22·4	...	9	...	15·2	...
2 Circulatory ,, ,,	1	...	4·7	...	...	...	...	...	2	1	3·0	1·48	...	...	...	...
3 Respiratory ,, ...	5	...	23·7	...	5	...	33·8	...	18	1	26·5	1·48	39	1	65·8	1·68
4 Digestive ,, ...	8	...	37·9	...	4	...	27·0	...	16	...	23·6	...	14	...	23·6	...
5 Urinary ,, ...	1	...	4·7	...	...	...	...	...	3	...	4·4	...	...	...	...	...
6 Reproductive ,, ...	...	...	...	...	2	...	13·5	...	2	...	3·0	...	1	...	1·7	...
7 Locomotive ,, ...	...	...	...	...	...	...	...	...	2	...	3·0	...	4	...	6·7	...
8 Integumentary,, ...	11	...	52·1	...	3	...	20·3	...	50	...	73·7	...	70	...	117·8	...
Class IV.																
4 Diseases of Nutrition...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	5·1	...
Class V.																
1 Accidents	11	...	52·1	...	3	1	20·3	6·75	48	...	70·8	...	52	...	87·7	...
Total	132	...	625·5	...	52	1	351·3	6·75	454	5	669·6	7·38	443	1	747·0	1·68

The admissions have not been very high in any of these groups; the highest proportion occurred among the troops proceeding to India, *viâ* Egypt; the excess among them was chiefly caused by diseases of the respiratory and integumentary systems, and by accidents. The only death was one in the 92nd Regiment, returned as inflammation of the lungs, and which occurred five days after embarkation at Cork. The highest ratio of deaths was among the men going to India by the Cape of Good Hope. One of the deaths was reported as by remittent fever; it did not occur till a month after the ship left Liverpool; two were by consumption and one by chronic bronchitis, and none of these cases came under treatment until after the vessels had been at least a month at sea; the other death was by pericarditis six weeks after leaving England. The death among the troops proceeding to the Cape of Good Hope was that of a gunner, Royal Artillery, who accidentally fell overboard and was drowned.

II. Troops Returning from Foreign Service.

The number of effectives shown in the Ship Returns as having embarked for England amounted to 10,567; representing an average *annual* strength of 929. There were 600 admissions on the sick list reported among them, and 14 deaths, being respectively in the ratio of 577 and 15·07 per 1,000 of mean *annual* strength.

The following Table shows the classes of diseases by which the sickness and mortality were caused. The detailed diseases will be found in Abstract No. 29 in the Appendix :— *Troops on Board Ship.*

Order.	Diseases.	From Abyssinia. Admitted.	Died.	Ratio per 1,000. Admitted.	Died.	From India, by Egypt. Admitted.	Died.	Ratio per 1,000. Admitted.	Died.	From India (by the Cape) and other Stations. Admitted.	Died.	Ratio per 1,000. Admitted.	Died.
	Stations												
	No. of men embarked ...	1,501				5,356				3,710			
	Average *Annual* Strength	96				500				333			
	Class I.												
1	Miasmatic Diseases ...	11	...	114·6	...	78	4	156·0	8·00	74	1	222·2	3·00
2	Enthetic ,, ...	24	...	250·0	...	54	...	108·0	...	89	1	267·3	3·00
3	Dietic ... ,, ...	1	...	10·4	...	...	...	...	...	...	...	...	...
4	Parasitic ,, ...	...	...	...	...	...	...	...	...	4	...	12·0	...
	Class II.												
1	Diathetic Diseases ...	...	...	...	...	6	1	12·0	2·00	3	...	9·0	...
2	Tubercular ,, ...	1	...	10·4	...	6	1	12·0	2·00	4	...	12·0	...
	Class III. Diseases of the—												
1	Nervous System ...	1	...	10·4	...	13	...	26·0	...	8	...	24·0	...
2	Circulatory ,, ...	1	1	10·4	10·41	3	...	6·0	...	...	...	...	...
3	Respiratory ,, ...	3	...	31·2	...	27	1	54·0	2·00	18	1	54·1	3·00
4	Digestive ,, ...	4	...	41·7	...	19	2	38·0	4·00	4	...	12·0	...
5	Urinary ,, ...	...	...	...	...	2	1	4·0	2·00	...	...	...	...
6	Reproductive ,, ...	...	...	...	...	2	...	4·0	...	4	...	12·0	...
7	Locomotive ,, ...	...	...	...	...	2	...	4·0	...	1	...	3·0	...
8	Integumentary,, ...	9	...	93·8	...	31	...	62·0	...	41	...	123·1	...
	Class IV.												
4	Diseases of Nutrition ...	...	...	...	...	12	...	24·0	...	4	...	12·0	...
	Class V.												
1	Accidents	6	...	62·5	...	15	...	30·0	...	15	...	45·1	...
	Total	61	1	635·4	10·41	270	10	540·0	20·00	269	3	807·8	9·00

The mortality was considerable among the troops returning from India, *vid* Egypt, not, however, from the prevalence of any epidemic, but from the results of disease contracted during service in that country. Three of the deaths were from dysentery, two from hepatic disease, one from intermittent fever, one from consumption, one from asthenia, the result of malarious disease, and one from disease of the kidneys, leaving only one from acute disease of non-malarious origin.

The admissions were rather high among the troops returning by the Cape, chiefly from the occurrence of venereal diseases among the men of the 2nd Battalion 9th Regiment, from Yokohama, where these diseases were very prevalent, and of 33 cases of ulcers on the legs in the same corps.

III. Troops proceeding from one Colony or one Station to another.

The number of the European troops in this group who embarked during the year is stated to have been 12,748, representing an *annual* strength of 831, among whom 456 cases and 10 deaths occurred, being in the ratio of 549 and

Troops on Board Ship

12·03 per 1,000. The following Table, framed from Abstract No. 29 in the Appendix, shows the influence of the different classes of diseases in causing this sickness and mortality.

Stations	Between Mediterranean, West Indies, and British America.				Between India and Abyssinia.				Between other Stations.			
Number of Men Embarked	4,327				3,561				4,860			
Average *Annual* Strength	89				230				512			
Order. Diseases.	Admitted.	Died.	Ratio per 1,000. Admitted.	Ratio per 1,000. Died.	Admitted.	Died.	Ratio per 1,000. Admitted.	Ratio per 1,000. Died.	Admitted.	Died.	Ratio per 1,000. Admitted.	Ratio per 1,000. Died.
Class I.												
1 Miasmatic Diseases ..	13	..	146·1	..	65	..	282·6	..	76	2	148·4	3·90
2 Enthetic „ ..	13	..	146·1	..	75	..	326·0	..	39	..	76·2	..
3 Dietic .. „ ..	..	..	..	..	1	1	4·4	4·34	3	..	5·8	..
4 Parasitic „ ..	1	..	11·2	..	1	..	4·4	..	..	..	..	..
Class II.												
1 Diathetic Diseases ..	..	..	..	..	..	..	..	..	2	..	3·9	..
2 Tubercular „ ..	..	..	..	..	1	..	4·4	..	4	..	7·8	..
Class III. Diseases of the—												
1 Nervous System ..	3	..	33·7	..	..	..	..	..	2	1	3·9	1·96
2 Circulatory „ ..	..	..	..	..	1	..	4·4	..	..	..	..	..
3 Respiratory „ ..	1	..	11·2	..	7	..	30·4	..	6	..	11·7	..
4 Digestive „ ..	1	..	11·2	..	20	..	86·9	..	15	2	29·3	3·90
5 Urinary „ ..	..	..	..	..	..	..	..	..	1	..	2·0	..
6 Reproductive „ ..	..	..	..	..	2	..	8·6	..	1	..	2·0	..
7 Locomotive „ ..	..	..	..	..	..	..	..	..	3	..	5·8	..
8 Integumentary „ ..	12	..	134·9	..	13	..	56·5	..	28	..	54·7	..
Class IV.												
4 Diseases of Nutrition ..	..	..	..	..	1	..	4·4	..	1	..	2·0	..
Class V.												
1 Accidents	6	..	67·4	..	19	3	82·6	13·05	16	1	31·2	1·96
6 Corporal Punishment ..	..	..	..	..	..	..	..	..	2	..	3·9	..
No appreciable disease	1	..	11·2	..	..	..	..	..	..	..	..	..
Total	51	..	573·0	..	206	4	895·6	17·39	199	6	388·6	11·72

The highest ratio of admissions and deaths occurred among the troops passing from Abyssinia to India; the former from the prevalence of intermittent fever, dysentery and diarrhœa, and venereal diseases, and the latter from the loss of three men accidentally drowned. The ratio of mortality was also rather high in the first group, from the occurrence of four deaths among troops proceeding from Malta to Bombay; two of these deaths were from fever probably contracted at Malta; the others were, one by inflammation of the bowels, and on by apoplexy. Of the other two deaths in this group one occurred by fracture on the passage from Ceylon to Bengal, and the other by inflammation of the pharynx, resulting from a large piece of glass being

impacted in it. No information is given in the Returns of the manner in which the glass came into that situation. *Troops on Board Ship.*

In addition to the troops included in the preceding Table, 336 men of the Ceylon Rifles, representing an *annual* strength of 28, embarked at Hong Kong for Ceylon; 28 cases occurred among them during the voyage, and one man died of general dropsy.

IV. Invalids, &c., Returning to England.

The Ship Returns show the number of invalids embarked to have been 3,033, and with them 1,706 time-expired and 860 effective men, making a total of 5,599, representing an *annual* strength of 868. There were 1,958 of them returned as "embarked sick"; 765 cases occurred among them on their passage, and 104 of them died. These deaths have been included in the mortality of the Commands from which the men were returning to England.

XVI.—SUMMARY.

The following Tables show the principal results relative to the health of the Army at home and abroad in 1868, and the average of the eight preceding years:—

SUMMARY, showing the Amount of Sickness, Mortality, and Invaliding, and the Average Number of Men constantly Non-effective from Sickness in the Army at Home and Abroad, during the year 1868.

	Mean Strength.	Admissions into Hospital.	Deaths.	Men sent to England as Invalids.	Discharged the Service as Invalids.	Average constantly Sick.	Annual Ratio per 1,000 of Strength.				
							Admitted into Hospital.	Died.	Sent Home as Invalids.	Discharged as Invalids.	Constantly Non-effective from Sickness.
WHITE TROOPS.											
United Kingdom	78,261	70,008	853	..	1,712	3,391	894	10·90	..	21·9	43·33
Gibraltar and Malta	10,008	8,343	141	224	147	421	834	14·09	22·4	14·7	42·07
British America	13,401	8,780	138	235	186	425	655	10·30	17·5	13·9	31·71
Bermudas	1,649	1,227	41	42	24	55	744	24·86	25·5	14·5	33·35
West Indies	1,598	1,351	14	68	37	62	845	8·76	42·5	23·2	38·80
Cape and St. Helena	4,051	4,410	46	223	113	239	1,089	11·35	55·0	27·9	59·00
Mauritius	1,318	3,079	36	48	5	97	2,336	27·31	36·4	19·0	73·60
Ceylon and Straits Settlements	1,006	1,210	22	31	16	51	1,203	21·87	30·8	15·9	50·70
Australasia	2,531	1,769	29	37	19	84	699	11·46	14·6	7·5	33·19
China and Japan	1,453	1,720	21	29	4	109	1,184	14·45	19·9	2·8	75·02
India	52,887	70,232	1,148	2,382	1,097	2,983	1,328	21·71	45·0	20·7	56·40
Abyssinia	1,494	1,332	54	333	76	72	892	36·14	222·7	50·7	17·11
On board Ship	4,258	2,902	31	..	..	..	681	7·28	..	..	..
Total	173,915	176,363	2,574	3,652	3,436	7,989	1,112	14·80	38·2	19·8	47·09
COLONIAL CORPS.											
Malta	593	485	7	..	..	..	822	8·37	..	..	..
West Indies	2,060	2,024	37	..	44	122	982	17·96	..	14·7	59·22
Western Africa	924	1,146	27	..		54	1,240	29·12	..		58·44
Ceylon	1,028	490	22	..	30	22	477	21·40	..	29·2	21·40
China	691	682	17	..	..	28	987	24·68	..	..	40·53
Total	5,296	4,827	110				911	20·77			

Summary.

SUMMARY showing the Sickness, Mortality, and Invaliding, and the proportion constantly Non-effective from Sickness per 1,000 of Mean Strength in the Army at Home and Abroad during the eight Years 1860–7.

	Annual Ratio per 1,000 of Strength.				
WHITE TROOPS.	Admitted into Hospital.	Died.	Sent Home as Invalids.	Discharged as Invalids.	Constantly Non-effective from Sickness.
United Kingdom	963·4	9·34	..	35·62	49·20
Gibraltar and Malta.. ..	808·5	11·32	22·65	16·80	42·52
British America	649·0	9·24	15·58	12·53	30·19
Bermudas	743·0	33·12	19·85	12·72	40·91
West Indies	1135·7	17·39	27·44	16·21	45·73
St. Helena and Cape ..	941·5	10·62	28·40	19·44	49·14
Mauritius	905·1	20·44	43·35	16·74	42·39
Ceylon	1451·2	23·20	53·53	22·50	69·60
Australasia	604·6	16·17	20·42	17·52	34·43
China and Japan	1967·6	54·94	57·60	21·74	77·11
India	1619·7	27·64	38·62	17·92	63·86
On board Ship	745·6	14·21	..	..	..
Total	1152·4	16·99	33·02	22·27	52·34
COLONIAL CORPS.					
Malta	809·6	6·70	..	..	..
West Indies	1029·9	26·14	..	17·44	50·26
Western Africa	1300·3	39·32	..		50·86
Ceylon	1105·3	14·86	..	14·76	35·22
China	1600·3	28·25	20·04	..	50·82
On board Ship	1298·2	16·05	..	..	..
Total	1200·9	25·10	..	..	..

Compared with the results for 1867, there has been a decrease in the mortality but a slight increase in the admissions, invaliding, and mean sick; but all were under the average of the last eight years.

There has been a reduction in both admissions and deaths in the Colonial Corps.

APPENDIX.

APPENDIX, No. I.

REPORT ON HYGIENE FOR 1869.

By E. A. PARKES, M.D., F.R.S., Professor of Hygiene in the Army Medical School.

THE year 1869 has been remarkable for a number of important observations in hygiene, and for much animated discussion on many points. The literature of the year is very rich in journal articles, especially on the questions of sewage removal, and on the relations of fungi, or low forms of plant and animal life, to disease.

As usual, of late years, the various Indian reports are among the most valuable contributions to sanitary science. The fifth Report (for 1868) of the Sanitary Commissioner, Dr. Cuningham, to the Government of India is a work of the greatest value. Dr. De Renzy's Sanitary Report on the Punjab is also most important, in connection especially with the water-spread of cholera, as well as in other ways; while Dr. Bryden's elaborate statistical work on cholera, presently to be referred to, will excite the deepest interest in all who attempt to understand this obscure problem. It is very much to be desired that the Indian reports should find a wider circulation in Europe than is at present the case.

The following are the subjects noticed in this year's Report:—

Air.
Food.
Sewerage.
Clothing.
The Specific Diseases.
Cholera.
Enteric Fever.
The Parasitic Origin of Disease.

AIR.

The important topic of the production of lung-disease by the inhalation of dust of different kinds into the lungs has been further illustrated by Dr. Greenhow.* From renewed careful *post-mortem* examination of miners', stonemasons' and flax-dressers' lungs, Dr. Greenhow entirely confirms the view of the ease with which small floating particles pass into the minute air passages, and even encroach on the alveoli, and pass into the interior of ciliated epithelium. Some experiments by Dr. Knauff† are confirmatory. He confined animals (chiefly dogs) in a box about four cubic feet in size, into which the particles of a sooty oil lamp passed. The animals were well fed, and were healthy; the period of the experiment lasted from one day to three months. The experiments seem to prove conclusively that the charcoal passes into the lungs, and when it is got rid of by expectoration it presents itself under the form of pigment cells. When Knauff inhaled fine particles of ultra-marine for only ten minutes, and examined his sputa, he found some cells containing blue particles in their interior. And, in fact, Knauff affirms (p. 459) that all the so-called lung-pigment, which is neither chemically nor morphologically distinguishable from charcoal (and this is the case with the specimens daily seen), is actually charcoal, and is not formed in the body but is introduced from without by the act of breathing. The blood-formation of pigment is, therefore, more uncommon, if, indeed, it is not extremely rare.

* Transactions of the Pathological Society, 1868-9.
† Virchow's Archiv. Band 39, p. 442 (1867).

A remarkable fact is noted by Knauff, viz., that in a cat the charcoal particles passed into the lymphatic glands in so short a period as three days; they also penetrated to the pleura, and apparently by the way especially of the lymphatics.

Knauff alludes to the action not of only soot but of particles of stone, metals, &c., on the lungs, and adduces further evidence, were it needed, of their mechanically irritating effect, which is followed by chronic pneumonia and induration. He mentions that of 36 stonemasons received into the hospital at Heidelberg in seven years 14 died, and of those, 13 died from phthisis and one from emphysema.

It is evident indeed, from all the observations, that the attention of physicians should be fixed much more than it is now on the effect of floating particles of soot, dust, &c., in the air of cities where coal is burned. Although we see the extreme action only in stonemasons, miners, &c., an attentive examination would no doubt trace back slight but still important effects to the inhalation of the smoky air of our great cities.

Dr. Angus Smith has pursued his investigations on the air of our towns, in connection with the contamination of the atmosphere by chemical works.* His fifth annual Report (as Inspector under the Alkali Act) contains many interesting observations on the constituents of rain-water, and on solid bodies in the atmosphere.

With regard to rain-water as indicating the composition of the air, in addition to chloride of sodium derived from the sea, and to other well-known impurities, Dr. Angus Smith directs particular attention to the sulphates. "The rain," he says, "contains sulphates in larger proportion to the chlorides "that exists in sea-water. This is true from central Germany to the most "northern Hebrides." (p. 4.)

The sulphates in the rain increase inland before large towns are reached, and in that case are, he believes, "a measure of the products of decomposition; the "sulphuretted hydrogen from organic compounds being oxidised in the "atmosphere." Indeed, he even thinks that when the burning of coal does not interfere, the sulphates may be taken as a measure of "sewage in air," but no good experiments are given on this point, and it seems going beyond the facts. In towns the sulphates increase very greatly in consequence of the combustion of sulphur in the coal.

If the sulphuric acid, from coal-burning or manufactures, increases more rapidly than the ammonia the rain-water becomes acid. When two or three grains are found per gallon, "there is no hope for vegetation in such a climate "as we have in the northern parts of the country." (p. 5).

This free sulphuric acid may decompose the chloride of sodium, and set free hydrochloric acid.

The ammoniacal compounds come partly from coal and partly from albuminoid substances.

In Manchester in 1868 the amount of sulphuric and hydrochloric acids (free and combined) in rain-water varied from 5·6 grains to 1·4 grains of sulphuric acid, and from 1·2775 to ·0278 grains of hydrochloric acid per gallon. At Liverpool the two acids made up as much as 3·2725 grains per gallon, and at Newcastle-on-Tyne 3·6789. The sulphuric acid is always in larger proportion, and is sometimes in very great excess.

It is a pity that the amount of *free* acid apart from the acids combined in sulphates and chlorides is not given.

With respect to ammonia in rain-water more was found in the air of towns; estimated in Wanklyn's method, it appeared that the "albuminoid ammonia" was also greater in the air of Manchester.

In addition to examining the rain-water, the air was washed, and the amount of these two acids (free and combined) determined. Dr. Smith is not, however, quite certain of the quantities of air, so that it need only be stated that the amount in Manchester was many times greater than at Buxton or Blackpool, where the air is purer.

* Fifth Annual Report of the Inspector under the Alkali Act (1863), of his proceedings during the year 1868.—Blue Book, 1869.

If the amount of the two acids in the air at the latter place be taken at 100 then the comparative results are—

	Hydrochloric Acid.	Sulphuric Acid.
Blackpool	100	100
Buxton	247	345
Didsbury	277	320
St. Helen's	516	468
Manchester	369	549

Both sulphates and chlorides appear in the last air, but free acids do not.

Dr. A. Smith also republishes his account of the solid bodies in the atmosphere, of which I formerly gave an abstract (Army Medical Report for 1866, vol. 8, p. 298).

Some analyses of the air of chimneys and of black smoke are also given. In the air of a common chimney there is little or no carbonic oxide, and it is only seldom that in ordinary smoke much of this gas is found. In black smoke there may be much carbonic oxide (6 per 100 volumes) or little (·02 per 100 volumes), but there is generally some. There may also be carburetted hydrogen. It is therefore clear that as carbonic oxide is so poisonous in very small quantities, it is a matter of great importance to health to forbid the passage of black smoke into the air. Black smoke may also contain sulphurous acid if much sulphur be in the coal. In one case there was as much as 33·48 grains of sulphuric acid in 100 cubic feet of black smoke.

At the end of this report (page 63), is a paper by Mr. A. E. Fletcher on a manometer for measuring the speed of air in flues, when the common anemometers cannot be used on account of the corrosive properties of the air, or of the clogging caused by soot. Based essentially on the principle of the manometer, as described by Péclet and others, it appears from the description to be a very simple and useful instrument, and a Table is given by which its indication can be read. Ether is employed instead of water in this manometer.*

Food.

Composition of Milk.—An investigation of the albuminous bodies in milk

* Since the above was written, several papers on the organic and other matters in air have been written.

Dr. Tyndall has shown, by a most ingenious experiment, that the floating substances in the air which reveal the ray of solar light entering a dark room can be destroyed by burning, and then the light disappears. That these substances are organic may be inferred (in addition to other evidence) from the fact that the burning gave rise (when combustion was not complete) to a fine blue cloud, and also because mineral substances would not be so completely dissipated. Whether this organic matter be living or dead, is not of course shown by this experiment; but Tyndall is evidently strongly impressed with the idea that it is living, *i.e.*, consists of the germs or developed bodies of minute creatures living in the air. A curious observation was made on the air from the lungs; the first portions of expired air contains so much dust of some kind, as to make the ray visible; the last portion of the expired air is pure, and the ray of light disappears. If a filter is placed before the mouth the air is freed from floating particles, and when breathed out again does not reveal the flame. These interesting experiments reveal, it is true, nothing not known before, but they place the matter on the solid ground of certain physical experiments.

Mr. Chapman (Chemical News, February 11th, 1870), by drawing air through finely-pounded pumice stone, which had been heated to redness, and then washing the stone in pure water, collected the suspended organic matters of crowded rooms, which he found to be nitrogenous and to contain volatile organic bases. Air from a sewer contained notable quantities of these substances.

Dr. Angus Smith (Chemical News, February, 1870) has also republished his previous observations on this point.

has been made by Zahn,* He has succeeded, by a special clay filter, in filtering milk, and obtaining a perfectly clear solution, not precipitably by acetic acid but from which an albuminous body was precipitated by heat, which was identical with the albumen of the serum of blood. The amount was very variable, ranging from ·108 to 1·45 per cent. In no case, however, was the milk entirely without albumen. The casein did not pass through the filter. Zahn also investigated the behaviour of casein in the presence of sodium carbonate, sulphate, and chloride. All the salts, when added in same quantity, caused coagulation on heating; the sodium carbonate had the greatest effect, and when in same quantity (4 C. C. of 10 per cent. solution to 2 C. C. of milk) caused coagulation even in the cold. The casein in the milk, according to Zahn, arises out of the albumen, which is combined in the first instance with sodium carbonate, and when this is neutralized by the gradual formation of lactic acid, the albumen becomes incoaguable by heat, and, in fact, passes into casein. Zahn has also obtained a body identical with casein, by heating serum-albumen with alcohol, and gradual formation of acetic acid. The experiment accords with the observations of Kemmerich,† who noticed that the amount of casein increases if milk is exposed for some time to a temperature of 37° to 40° C., while the albumen lessens. Lehmann many years ago observed that albumen treated with caustic alkalies furnished a body with the characters of casein. The transformation of albumen into casein seems thus to be rendered very probable.

Not only does the casein increase when the milk is exposed to the air, but Kemmerich found that the fat also increases. This observation was made by Hoppe-Seyler‡ some years ago, and was attributed to the destruction of casein. The observations of Hessling§ are referred to by Kemmerich, in evidence that this formation of fat from casein is owing to the action of fungi, or perhaps vibriones, which so rapidly appear in milk on exposure; and it would appear that it is especially the young and growing vibriones who thus decompose the casein. When the spores are destroyed or hindered from increase, the fat of the milk, instead of increasing, gradually declines, in consequence, doubtless, of oxidation. The same thing occurs in cheese, and also in other albuminous liquids, as almond emulsion, in which Kemmerich states that the growth of fungus-spores causes an increase in the fat.

Milk causing Disease—American Milk Sickness.—A peculiar disease, known by the name of the "Milk Sickness," has been from time to time noticed in the Western States of America.‖ The disease (first described by Drake in 1809) appears to be marked by prominent nervous symptoms, and to be caused by the milk, or butter or cheese made from it, and occasionally by the flesh of cows affected by "milk disease." The particular disease of the cow is known by the name of the "trembles," on account of the great quivering of the whole body which follows a period of great weakness and slight trembling of the animal. The flesh of the cow is said to give the disease readily to dogs, who are very susceptible, and occasionally to men; the appearance of the flesh is in no way altered, nor is the milk affected either chemically or physically.

Since 1840 very few, if any, notices have appeared of this affection, but in 1863 two papers were published,¶ from which it would seem that this affection is again becoming prevalent among children in the Western States. Dr. Smith describes it in Kenton, Ohio, where there were 50 cases and 7 deaths. The symptoms were sudden extreme weakness, vomiting, remarkable sinking of body-temperature, great expression of anguish; a peculiar sweetish fætor of

* Archiv für ges. phys., von Pflüger. Band 2, p. 598. 1869.
† Archiv für ges. phys. Band 2, p. 401. 1869.
‡ Virchow's Archiv, 1859. Band 17, p. 449.
§ Virchow's Archiv, 1866. Band 37, p. 561.
‖ Hirsch (Handbuch der historich-geographischen Pathologie, Band 2, p. 282), has carefully described this disease in cows, and has given all the references. He has also noted the cases referred to in the above paragraph in his Report in the Jahresb. für ges. Med. for 1868, Berlin, 1869, Band 2, p. 294.
¶ Dr. Smith in the "Boston Medical and Surgical Journal," January 9th, and "Transactions of the Kentucky State Medical Society," quoted in the "Medical Times and Gazette," August 1868.

the breath, swelling of the tongue, which became dark and dry in bad cases; obstinate constipation, and a feeling of pulsation in the abdomen, especially to the right of the umbilicus; severe headache and ear-noises, and palpitation, with almost normal radial pulse. The disease ran its course in a few days. It was remarkable that among German and American families living side by side, it was only the children of the latter who were affected, the reason apparently being that the Americans used fresh milk at once, while the Germans always boiled it. Complete investigation of this very interesting outbreak would be most desirable.

The Milk during Foot-and-Mouth Disease in Cows.—The severe outbreak of foot-and-mouth disease (the so-called eczema epizootica) which has lately occurred in England * has given renewed oppportunity of observing the effect of the meat and the milk of diseased animals on men. It had previously been known that men sometimes, though rarely, suffer with symptoms somewhat resembling those in cattle, and apparently attributable to direct contagion; but the evidence with respect to meat and milk was very conflicting. The experience of 1869 has not completely cleared up the subject. The propagation of the disease to pigs, most usually by the serous and purulent discharges from the mouth and feet, but also sometimes by the milk, seems undoubted. Sheep and poultry also suffer. The direct transmission to men by the serous and purulent fluids is far less frequent, and in some of the reported cases the affection produced seems more like an inoculation of a purulent or septic fluid than the operation of a specific poison.† The meat (which is not altered in appearance in any way) does not, when cooked, seem to be injurious to men. The question of the influence of the milk is far more difficult. In mild cases the milk shows no physical or chemical alteration. The first change seems to be a fall in specific gravity (to 1024°).‡ The microscope shows aggregation of the milk corpuscles, and also rather more granular matter than usual, and granular bodies like those in colostrum. Afterwards, especially though not solely, if there has been inflammation of the udder or the teats, pus and blood may pass into the milk, and in very bad cases the milk has a reddish colour from blood, and is watery. Pus appears in all cases, and can be detected for even a month after recovery.§ If matters are not so bad as this the milk looks much as usual; in some cases there seems to be even more cream, but this is perhaps from pus rising with it. When boiled it not unfrequently coagulates (from excess of albumen?) and the whey has a bluish tinge, but this is not invariable. Bacteria and small oval and round cells are common.

The taking milk containing pus and large quantities of granular matter, and also evidently decomposing, as shown by bacteria, would at first sight appear to be almost certainly attended with danger. But it is remarkable that the positive evidence of injury is weak, and the negative evidence is strong.‖

* This outbreak gives a good illustration of the great influence of one of the factors of the spread of contagious diseases, viz., personal susceptibility. The foot-and-mouth disease was almost extinguished in England by the Cattle Plague Regulations of 1866. Consequently a fresh generation of cattle had arisen in 1869, which had not had the disease, and were all susceptible. The rapid spread was probably entirely owing to this and not to any variation in the physical conditions of the poisonous discharges, or in the atmospheric influences.

† For a collection of instances, some of which illustrate the above remarks, see Professor McBride's cases in the "British Medical Journal," November 13th, 1869.

‡ *Professor McBride*, in "Lancet," October 23rd, 1869.

§ Professor McBride, in "Lancet," October 23rd, 1869.

‖ Take, for example, the evidence of Dr. Lawson Tait, "Medical Times and Gazette," October 23rd, 1869. Although surrounded by the disease, and the milk was used as usual, "not a single case occurred to raise the slightest suspicion that "the use of the milk was in the least detrimental," and it was used in the West Riding Asylum without injury. Dr. Whitmore, "British Medical Journal," October 1869, states that the cow-keepers in Marylebone gave the milk freely to their own children without injury. Mr. Holmes, "British Medical Journal, September 18th, 1869, gave the cream and milk from his own infected cow to his family, and among them to a child 12 months old without bad effects. Other negative instances are noted in the same journal.

It appears undoubted that the purulent discharges arising from coincident mammitis will cause stomatitis, just as they will do so when foot-and-mouth disease is not present.* But the milk from uncomplicated cases seldom caused injury; still, there are several cases on record in which it seems very *probable* that injury did result, and, as pointed out by Professor M'Bride, it must be remembered that the diseased milk, when used by a family, has generally been mixed with the milk from healthy cows, has often been largely diluted with water, and has generally been boiled. So that the chances of injury from it are lessened. And if we also admit that the milk can give the disease to pigs it seems only fair to conclude that the injurious effects, if proper experiments could be tried, would be greater than the published evidence at present shows.

Fish causing Diarrhœa.—It is well known that some kinds of fish, even when quite fresh, will cause great gastro-intestinal irritation. A case is recorded in the "Statistical Report of the Health of the Navy for 1867,"† in which a violent attack of diarrhœa was caused on board Her Majesty's ship "Bristol," at Elephant Bay, on the West Coast of Africa Station, by the use of fish. On the afternoon of the 10th of June a large quantity of fish was caught, and was eaten for breakfast on the following morning, for dinner, and by a few men for supper. During the following night, 47 men, and on the next day 56 more, were attacked with most violent cramps in the stomach, vomiting and purging; in some cases there was considerable collapse. It seems unlikely, considering that only 24 hours elapsed (in most cases) before the fish was eaten, and that it had been cooked, that decomposition simply should have caused such severe symptoms; and it seems more probable that the fresh fish were poisonous. The kind of fish is not stated.

Cheese causing Diarrhœa.—In the same Report on the Health of the Navy (p. 233), it is mentioned that a sour cheese bought from the Portuguese, and not unlike cream cheese in appearance, brought on diarrhœa, vomiting, and griping in all that used it.

The Effects of Alcohol.—In this country and in France, the experiments of Sidney Ringer and of Perrin, coupled with the observations made by persons under the influence of cold, have been admitted as proving that alcohol lowers, as a rule, the temperature of the body, and only exceptionally and transiently raises it. In Germany, however, a different opinion is still held by some authorities, and two new investigations in this direction will be welcome. The first is by Cuny Bouvier,‡ who has made 48 experiments with various doses of alcohol on rabbits, cats, dogs, and men. The temperature was measured in the rectum. The result in all cases was the same; no rising of the thermometer was ever observed, and in all cases, except where the dose of alcohol was extremely small, there was depression of temperature. The pulse was quickened. He then tried the effects of alcohol on rabbits and dogs in whom he had excited fever by putrid injections, and succeeded in reducing the febrile temperature considerably, when the alcohol was given in large doses and continually.

Beer, containing 3 to 4 per cent. of alcohol, had a slight lowering effect (·5° C.) on temperature, but this is in part attributable to the coldness of the liquid and the carbonic acid. In the case of wine containing 8 and 17 per cent., and of which 4 and 2 ounces respectively were taken, the temperature very slightly fell (·2° C.). The effect of the alcohol is ascribed by the author to a probable arrest of oxidation in the blood and tissues.

The second work on the same subject is by Richardson,§ and is a very valuable addition to our knowledge. The introduction of alcohol into the body, in frequent and small doses, which do not produce intoxication, is attended with reduction of temperature, limited to 1° or 1·5° Fahr., in small mammalia. "This result is definite as the result of the administration." When the dose of alcohol is pushed on to intoxication (of which Richardson

* See for a good case of aphthous ulceration of the mouth arising from milk contaminated with pus and blood from a cow with non-specific abcess of the udder, Mr. Fagan's paper in the "British Medical Journal," November 6th, 1869.

† Published in 1869, p. 233.

‡ Archiv für ges. Heilk. 1869, Band 2, p. 370.

§ "Medical Times and Gazette," December, 1869.

makes four stages, viz.,—1st. Simple exhilaration; 2nd. Excitement; 3rd. Rambling insensibility; and 4th. Entire unconsciousness, with muscular prostration), there is a slight increase of temperature at first, and then a great decline. In birds, he reduced the temperature no less than 6° Fahr.; in rabbits, 2½° to 3°, which is rather less than Bouvier found.

With regard to the action on the muscles in the deep sleep of unconsciousness, the voluntary muscles act independently of the will, or of reflex action. It is "usually an automatic movement," according to Richardson: that is, I presume, a movement from an unknown cause. The respiratory movements gradually cease, the diaphragm continuing latest; the heart acts longest, and can be seen to beat after the breathing has ceased. After death, the lining membrane of the stomach is much congested, and there is a strong odour of alcohol in the contents of the stomach, even though the alcohol be introduced by inhalation; the kidneys are intensely congested; the bladder usually empty; the brain is congested; the lungs white and bloodless; the heart full of blood on both sides, and with its vessels engorged. The blood corpuscles, even before death, are shrunken, crenate, and some are elongated and flattened with truncated ends.

The above remarks refer to ethyl-alcohol, but Richardson has also investigated the effects of some other alcohols,—methyl, propyl, butyl, amyl, and caproyl, or hexyl. The three latter alcohols produce effects somewhat different from those following the use of common or ethyl-alcohol, the most marked being the great prevalence of muscular tremors, which Richardson thinks are identical with those arising in delirium tremens in men. It is a very interesting fact that Richardson found the narcotic effects of the different alcohols increase steadily as the proportion of carbon in each kind increases. All the alcohols agree in depressing bodily temperature.

An investigation on the action of alcohol (wine or ethyl-alcohol) has been made by Obernier.* His observations were made on a man whom he kept in bed; the temperature was taken in the rectum about every hour or two hours. On three days no alcohol was given; on two it was given in not excessive doses (120 to 160 C.C., or from 4 to 5½ ounces of strongly-rectified spirit in the day). Obernier could discover no lowering of the temperature; he thinks there were even slight risings, and his Tables show these were very slight, if they existed; and in all the experiments he does not seem to have paid sufficient consideration to the normal rise of temperature which occurs in the afternoon.

Obernier also examined the effect of wine in typhoid and hectic fever: he could find, even when the wine was pushed to intoxication, no lowering of temperature, but, on the contrary, a rise. He made a few experiments on the urine of a patient who could not swallow; and as the food was administered by a tube, he received exactly the same amount daily. On two days out of seven, alcohol was given, with the effect of increasing the quantity of water, and lessening the specific gravity and the amount of urea, and the urine had a distinct smell of spirit.

In conjunction with Count Wołowicz, I have made some experiments with alcohol and brandy on a healthy man. The experiments are not yet published, but we could find no alteration in temperature even by the use of 8 fluid ounces of absolute alcohol in 24 hours. The pulse was much quickened; the metamorphosis of the nitrogenous tissues was totally unaffected.

In addition to these physiological papers, some very interesting experiments on dogs are recorded in an essay by Kremiansky, a Russian Army Surgeon, on pachymeningitis interna hæmorrhagica. In this essay, hæmorrhagic meningitis, and also other pathological changes in the brain vessels and membranes, especially the dura mater, were produced in dogs by giving them alcohol.† In men, also, Kremiansky has followed out a clear history of excess of brandy producing precisely the same effects. The whole essay is very important as explaining clearly the simple origin, in bad dietetic habits, of some formidable brain diseases.

With regard to the employment of alcohol as a dietetic agent, the following interesting remarks are made by Richardson:—

* Archiv für die ges. Heilk. Band 2, p. 494, 1869.

† "Virchow's Archiv," Band 42, see especially p. 338 et seq.

"Speaking honestly," he writes, "I cannot, by any argument yet pre-
"sented to me, admit the alcohols through any gate that might distinguish
"them apart from other chemical bodies. I can no more accept them as food
"than I can chloroform, or ether, or methylal. That they produce a tempo-
"rary excitement is true; but as their general action is quickly to reduce
"animal heat, I cannot see how they can supply animal force. I see clearly
"how they reduce animal power, and can show a reason for using them in
"order to stop physical pain, or to stupify mental pain; but that they give
"strength—*i.e.*, that they supply material for the construction of fine tissue
"or throw force into tissues supplied by other material—must be an error as
"solemn as it is widespread. . . . . To resort for force to alcohol is to
"my mind equivalent to the act of searching for the sun in subterranean
"gloom, until all is night."

These remarks are of great practical importance to Army Surgeons, in connection with giving spirits to troops on the march, as a matter of routine issue. I have elsewhere given evidence against this practice; and I may now quote, as additional evidence, a fact stated by Staff Assistant-Surgeon Neill:—"I observed," this officer writes, "in New Zealand that the troops marched "better, and with less fatigue, even during the winter, when exposed to wet "and cold, if no spirits were given."

In connection with the use of alcohol, I may refer to an important paper by Dr. C. A. Gordon, C.B.,* in which an account is given of the prevalence of drunkenness in India in former days and now. It is well to have on permanent record some account of the way in which men formerly killed themselves in India, of the culpable participation of the Government in these practices, and of the strenuous exertions of the Medical Officers to combat the evil. That these exertions have eventually borne fruit, we all know, but even now the Medical Officer will find work enough to do to stem the influences which constantly tend to drive men into habits of drunkenness. He would surely find few arguments stronger than the evidence he could bring forward, that alcohol strikes at the very root of that which a soldier regards with the most pride, viz., his personal strength and activity.

Sewerage.

Removal of Sewage.—The discussion on the best method of removing the sewage of towns continues with unabated activity, particularly in Germany. A new periodical on Hygiene† contains numerous papers by Varrentrapp, Hobrecht, Reclam, Semon, and others, on the subject. They all deal, however, with topics familiar to us, so that it is unnecessary to analyse them here; but they can be recommended as giving a very thorough view of the subject.

A Report by Dr. Hewlett, of Bombay,‡ can be strongly recommended as giving a very complete view of what is now being done in many of the large English towns.

Two papers of considerable interest have been published by Mr. Stanford.§ In the first paper, Mr. Stanford entirely objects to the plan of water removal, and he gives due weight to the difficulty of the earth system when applied to large cities; but the objections to the earth plan are obviated, he thinks, by employing charcoal from sea-weed. This substance is, he states, a much better deodorizer than earth, and one-fourth of the weight of earth only is required. It can be stored for a long time, used several times, and re-burnt if desired, while the ammonia it has absorbed may be obtained. In order to show how this works, Mr. Stanford has given in his second paper‖ a series of analyses showing the composition of the charcoal after use and re-burning, so as to fix its commercial value. The general result of one set of experiments is thus given:—

* "Drunkenness in India and its Repression."—"Medical Times and Gazette," October, 1869.

† Deutsche Vierteljahrsschrift für öffentliche Gesundheitspflege, 1869."

‡ Report of a Sanitary Tour. Official Report made to the India Office, 1869.

§ "A Chemist's View of the Sewage Question."—"Chemical News," June to October, 1869.

‖ Chemical Method of dealing with the Excreta of Towns.—"Chemical News," 1869.

"Taking these data, 1 ton of char which had been used five times would "yield, allowing 15 per cent. moisture, 48 cwts. of manure, containing nitrogen "equal to 18 per cent. sulphate of ammonia, 15 per cent. phosphate of lime "(reckoned as soluble), and 7½ per cent. sulphate of potash, and worth 7*l.* per "ton. Its cost for char, 2*l.*, and for cartage (5 tons in and 10 tons out, equal "to 15 tons), at 1*s.*, equal to 15*s.* If advisable to hasten its sale by drying, it "would cost 10*s.* more, the total cost being 3*l.* 5*s.*, or about 28*s.* per ton. If "re-burnt and returned to the closet, the re-burning would cost 3*s.* 6*d.* per ton, "or 8*s.* 6*d.*, and yield over 8 cwts. of sulphate of ammonia at 16*s.*, equal to "6*l.* 8*s.*, less cost of acid, and, allowing 10 per cent. for moisture, 33 cwts. of "char, partly to return to the closet and partly for sale as manure. I think "these data are sufficient to show that this process presents the means of "recovering the total value of the excreta. In addition, there are other unex-"pected sources of further profit; for 100 tons of dry solid excreta yield 9 tons "of tar and 4 tons of acetate of lime, besides a considerable quantity of "richly-illuminating gas."

Of course, such calculations as these are subject to considerable corrections for costs of working, apparatus, &c., but they seem to show that the plan would not be a losing one commercially, while the charcoal is certainly a good deodorizer, and is more manageable in respect of carriage than earth.

But it might be objected, that the supply of seaweed charcoal would not be nearly sufficient, did such a plan come into general use. To this Mr. Stanford replies, "that ultimately the process depends only on the char from "the excreta itself; but its general adoption would, nevertheless, create suf-"ficent demand for seaweed char to revive the value of kelp-bearing shores." He, therefore, seems to anticipate no difficulty in the supply.

It is singular that a system in some respects founded on similar considerations has been commenced in India by Mr. Hickey.*

The little treatise in which this plan is recorded being published in India, will perhaps, not be much seen in England, but it merits a wide circulation and consideration. Mr. Hickey's plan is prefaced by a few pages of comment by Dr. Mouat, the eminent Inspector of Gaols in Lower Bengal. Dr. Mouat has extensively tried the dry earth system in the Bengal gaols, and with the most satisfactory results. He considers the water system quite unsuited for India. He is very careful with the details of the earth system: he dries and powders the earth in pug-mills, and immediately applies the excreta to the land. He finds that a much less quantity of earth will do than is commonly stated, and considers that the "immediate utilization of the product in cultivation is the "complement of the dry earth system." He entertains little doubt that the earth is really a disinfectant, and states that since the plan was carried out, in some gaols, "which were formerly decimated by cholera, the disease is now "nearly unknown."

Dr. Mouat, however, thinks that Mr. Hickey's plan, if it is commercially practicable, will be even better than the earth, because *all* possible hurtful agencies must be destroyed by the heat which is applied.

This plan is briefly as follows:—The excreta are conveyed as soon as possible (either after mixing with charcoal, or without this) in tubs and carts arranged for the purpose to vessels where the mass is subjected to a little pressure, in order to expel some fluid. The mass is then placed in cast-iron or clay retorts, and is heated; a large quantity of illuminating gas is given off, besides ammonia and similar volatile matters, which are arrested in water chambers; the gas can be used for lighting or for heating other retorts, and special arrangements are made for each case. The ammonia and other products are collected and utilized. The charcoal left in the retorts is a black inodorous powder, and may be used either to deodorize excreta, or at once sold as manure. The inventor has not given any details of expenditure, or drawings of the apparatus, but claims for his plan, "that it is perfect in a "sanitary point of view; that it is economical; that the manure is of first "quality, portable, and innocuous: that the gas is luminous and innocent; "and that the poudrette (charcoal in retort) is a perfect deodorizer for solid "and liquid filth."

* The carbonization or dry distillation system of conservancy by W. R. G. Hickey, C.E., with a note on dry sewage by F. J. Mouat, M.D. Darjeeling, 1869.

It will be seen that in principle Mr. Stanford's and Mr. Hickey's views have a great resemblance. As to the merits of the plan, it is quite clear that, in a sanitary point of view, it is as good or better than the dry earth, as charcoal is a better deodorizer and as a less quantity is required; but the success of such plans entirely depends on the question of money; if, by utilizing the gas and other products in the best commercial way, money can be made by this plan, or a less expenditure undergone than by the dry earth method, it will supersede that system; on the other hand, the expense of the plant, the working of the retorts, and the collection of the excreta (which will have to be free from foreign admixture) may be greater than is supposed. One difficulty in the economical working of any plan of the sort is the amount of water (75 to 85 per cent.) which even so called dry fæces contain; add to this, a certain quantity of urine, which cannot be got rid of, and there is a large amount of water to be driven off, and therefore a large expenditure of unproductive heat must be anticipated.

Clothing.

In last year's Report, an account was given of Tardieu's experiments on the poisonous effects of coralline when used as a dye. Nothing, apparently, could be more conclusive than his experiments, but, curiously enough, they appear to have been erroneous. M. Landrin repeated* Tardieu's experiments on men, dogs and frogs, and could produce no effect whatever with it when it was pure. M. Guyott has again repeated Landrin's experiments, and has tried the effect of coralline on himself with the result of proving conclusively that pure coralline is harmless. Tardieu must have worked with an impure substance.

The Specific Diseases.

Cholera.

The epidemic of cholera in 1865–66 in Europe is still traceable in medical literature. A considerable number of independent works and essays have been published; among others may be mentioned the work of M. Fauvel, the delegate from France to the Constantinople International Sanitary Conference.‡ This is a sort of *proces-verbal* of the Conference, and contains the various documents used at the meetings and some of the discussions. The conclusions and the preventive measures have been already so fully recorded that it is unnecessary to repeat them here, but the work itself will be found very useful for those who wish to have a complete record of the proceedings.

In Germany, Dr. Günther, whose excellent treatise on cholera in Saxony in 1865 was referred to in a former report, has published a work on cholera in Zwickau (Saxony) in 1866,§ from which some points of interest may be noted. With respect to the influence of ground-water, no measurement of wells was undertaken in Saxony in 1866, but there was a general complaint of scarcity of water, which seems to indicate a lower level; no antecedent abnormal height of ground-water had preceded this, at least, the previous rainfall had been small (page 9). The drinking-water was "without provable influence on the origin, "spread, and intensity of cholera" (page 10). Günther was equally unconvinced of the bad effect of contaminated drinking-water in 1865, and certainly it seems evident that mere common impurities in drinking-water have nothing to do with cholera. As far as meteorology is concerned, the intensity of the epidemic coincided with the hottest weather (7th of September to 5th of October 1866); no direct influence was traceable to the daily fluctuations of pressure, temperature, ozone, or rain.

With respect to the origin of the cholera in any place, it ws proved in 36 per cent. of the outbreaks, that the first cases of disease had been in communication with infected places, and, in the greatest number of the re-

* Comptes Rendus, 28th Juin, 1869.

† Comptes Rendus, Août 1869.

‡ Le Cholera; Etiologie et Prophylaxie, &c. Par A. Fauvel, Délegué du Gouvernement français à la Conference. Paris, 1868.

§ Die Indische Cholera im Regierungsbezirke Zwickau im Jahre 1866, von Dr. Rudolf Günther. Leipzig 1869.

mainder, the same intercourse was probable. Some very marked instances of conveyance by clothes are noted (page 15). In the village of Reinholdshain (half an hour's journey from Glauchau) a woman died from cholera after washing the clothes of a person who had died from cholera in Gesau; no other cases occurred in the village. In the same way, in Glauchau, on the 13th of July, a case occurred, although at that time, neither at Glauchau or in the neighbourhood, was there a single case of cholera; the only assignable cause was that this woman had washed clothes on the 8th and 9th July, which came from a person ill in Stettin with diarrhœa. In Stettin cholera was epidemic at the time, and it is to be presumed that the so-called diarrhœa was cholera. The son of the washerwoman and his wife, who had also assisted in the washing, were then attacked. The next persons attacked were two Prussian soldiers, who arrived from an infected place on the 24th July.

So, also, Dr. Günther states that when the influence of occupation was determined, the women engaged in washing the body-clothes showed the greatest disposition to the disease and the greatest mortality (page 40).

In this epidemic the introduction of cholera by Prussian troops (who largely suffered from cholera in the Bohemian War) was very frequently observed, and in some places cholera was introduced, died out, and was then re-introduced several times. In some instances, the passage from case to case at the commencement of an outbreak was followed with great ease, and these facts are interesting in another way as showing, in some instances, a short incubative period. Thus, in Meerane, the following cases were seen :—In the night of the 23–24 July, 1866, some Prussian soldiers, marching through, were billeted at a baker's house; one soldier was so ill with violent vomiting and diarrhœa that he could hardly "drag along." A maid who washed the boards which were soiled with the discharges from this man, was taken with cholera early in the morning of the 26th July, and died in the early afternoon. The baker was attacked at the same time, and died at noon; on the 28th, a daughter of the baker was attacked, and died the same day. There were 10 persons remaining in the house, who were removed to the hospital, and of these two more were taken ill and one died. The propagation of the disease to a neighbouring house by means of the impurities of this infected house was traced.

These and similar cases, of which many could be cited, are strongly opposed to the idea that cholera discharges must decompose before they produce the disease.

At page 19, *et seq.*, Dr. Günther gives other cases, equally striking, of the introduction and immediate origin of the disease from travellers. Although this direct propagation from an infected person is not so common as the more indirect and concealed transit, it is impossible not to receive such facts as are recorded as true, and it seems equally impossible to explain them except in one way,

There is one important fact mentioned (page 21), viz., that chlorine gas had no effect; at least, a boy of ten years old was attacked and died who lived in a house attached to a chemical works where there were great stores of chloride of lime, which filled the house almost always with the odour of chlorine. However, the boy might have got the disease elsewhere.

The mortality in this epidemic was 50·1 per cent. When many cases occurred in one house it reached 70·6 per cent.

In some places there was immunity from cholera, and the causes of this were very obscure. The most remarkable instance was that of Crimmitschau, a town with 12,248 inhabitants, 10 miles from Zwickau, and near many other places all severely affected, and with which it is connected by railway. Cholera was imported both in 1865 and 1866; in the former year there were six cases and one death; in the latter, four cases and three deaths. Compared with the adjacent towns of Zwickau, Werdau, and Glauchau, where cholera prevailed, it is found that the people are of the same class, the occupations are the same, the compression of the population nearly equal, and the mode of living alike (a little less meat in Zwickau than in Crimmitschau, 47·6 and 56 lbs. per head yearly, but more in Werdau, 62·1 lbs. per head yearly, than in Crimmitschau). The geology, as given by Günther, shows nothing remarkable but the exact relation of the soil and soil-water (as worked out by Pettenkofer in the case of Lyons) is not given, nor is there any account of

the method of disposing of the excreta. It seems at present, impossible to account for the exemption of Crimmitschau.

Another exemption from attack was in the prison at Zwickau. There were from 1,026 to 1,286 men in this prison, and prisoners were received during the whole time of the cholera outbreak; the disease was all round, and in the families of the officials living outside the prison 26 cases occurred, yet no single case occurred in the prison. The exemption was not owing to isolation and quarantine, nor apparently to any peculiarity of soil. Dr. Günther's remarks on this point are interesting.

"I cannot trust myself to determine to what circumstances this exemption "of the prison is to be ascribed; whether to the measures of disinfection "commenced before the outbreak of cholera and carried on vigorously during "them (by means of sulphate of iron in the privies, of sulphur in the drains, of "chlorine gas in the rooms), or to the regular mode of life, or to other circum-"stances. The privies are so arranged, that the excrements are received in "particular vessels, which are daily removed and emptied. Disinfection in "these vessels is so far carried out, that finely sifted coal-ashes are plentifully "spread over the excreta, and a little quantity of iron sulphate is poured on. "When the cholera approached the region of Zwickau, the disinfection was "increased; the drains of the separate cells were sprinkled, many times daily, "with solutions of sulphate of iron or chloride of lime; so also were the pits "in which the above-mentioned vessels stand. Smokings with sulphur and "chlorine were also used, and bowls containing chloride of lime were placed "about. The closets, night tubs, &c., were daily disinfected with chlorine. "No change was made in the mode of living, except that green vegetables and "potatoes were more seldom given; coffee was allowed in greater strength; "in the evening, often beer soup; for drinking, boiled water only was "allowed. All who performed duties in the open air, and all old and sick "people, as well as any who desired it, received woollen body-rollers. Woollen "stockings were taken into use earlier than usual. In respect of accommoda-"tion no change was made, except that in certain cases double bed-clothes "were given; that all the rooms used by the prisoners were well ventilated, "and when the prisoners were away, were disinfected by chlorine gas or by "burnt or evaporated vinegar (p. 26)."

Dr. Günther evidently ascribes the chief preventive action to the disinfection so carefully carried out, for he writes, "that a careful disinfection is not "useless. I might conclude, from the circumstance, that also in the district "hospital at Zwickau, in spite of repeated importations, cholera appeared "neither in 1865 or in 1866 (p. 37)." The disinfection of the privies in this hospital was first carried out with sulphate of iron, and later, with a disinfecting powder consisting of loam, lime, and carbolic acid.

With respect to disinfection in cholera, allusion was made in the last report to the Bristol experience carried out by Mr. Davies and Dr. Budd. Mr. Davies long since published a striking paper on the measures taken in Bristol to prevent the spread of the specific diseases.* We learn from that paper that in 1832 there died in Bristol of cholera, nearly 1,000 persons; in 1849 there died 1,979; and in 1854, there died, 430. In 1866, only 29 persons were affected, and these mostly came into the town with cholera. Cholera was introduced at 26 points, and was stopped from spreading at each. The plan was as follows; a system of such rigid inspection that each case was at once known; immediate visitation of the case; thorough disinfection of the ejecta, vessels, &c., by strong chemicals; burning contaminated clothing by fire; and the cessation of the use of all water drawn from wells or land water. Of the chemicals used, "real" carbolic acid was chiefly trusted.

In India, several reports have been published of great interest. The first is one by Dr. Murray,† dealing especially with the treatment of cholera. But there are various parts of interest in connection with the spread of cholera, some of which may be given here.

* Four years' experience as a health officer in Bristol. "British Medical Journal," November 13th, 1869.

† On the treatment of Epidemic Cholera, by John Murray, M.D., Inspector-General of Hospitals, Calcutta, 1869.

With respect to water poisoning, Dr. Murray states (p. 5) that "there were "two remarkable instances during the Hurdwar epidemic of the inhabitants "being attacked by cholera on the 2nd day after the poison had been commu- "nicated to the village tanks. In one instance from a pilgrim suffering from "cholera having bathed in it, and remained on the banks during the day, "and, in the other, after the clothes of a man who had died from cholera "were washed in it." *

In this case, as in those quoted from Günther, it will be seen that the incubative period is very short.

The following is an example of another kind, and seems to give us another instance of the occasional long incubative period, a point of great practical importance, and of which there are now several good cases on record. Dr. Tulloch† relates the following case:—On the 21st May, 1859, he embarked at Calcutta on the ship "Gertrude," in medical charge of invalids and soldiers for England. Cholera was prevalent in Calcutta, and cases had occurred on board other troop ships bound to England. The "Gertrude" reached the equator without any sign of cholera.—On the 15th June (24 days after leaving Calcutta, when in 4° S.L., a soldier, invalided for ophthalmia, but convalescent from dysentry contracted on board, was seized with cholera and died next day. The chief officer of the ship, "perhaps the strongest and healthiest man on "board," was seized and died in 3½ hours. In the afternoon, a boy six years old (a soldier's son), was attacked and died. On the 20th, a soldier, convalescent from dysentry, was seized, and on the 25th, a sailor. Both died, and, in fact, the disease was mortal in every case. In this instance, two soldiers, one soldier's son, and two sailors, were attacked, so that the disease was disseminated. Did they all get it on shore; or was there passage in some instances from case to case? The cessation of the disease seems to indicate the former: but, if so, it is remarkable that in five persons there should have been so long an incubative period, which, in the last case, must have been nearly 34 days.

Dr. Murray gives (p. 5 and 6) some good evidence on the beneficial effect of removing troops when properly carried out. The experience of the prison at Agra is strong. In three epidemic attacks, before removal was practised, the admissions were 392·29, and the deaths 60·53 per 1,000. In four epidemic attacks, when removal was practised, the admissions were only 68·99, and the deaths 17·02 per 1,000. The statistics among the European and native troops are also very favourable to the plan of marching out, but as this point is now being carefully enquired into in India, in consequence of some failures, it is desirable not to enter on it at present.

Dr. Murray mentions that cholera encamping grounds, which had in the meantime been cultivated, were occupied the following year without injury. The effect of an encamping ground recently used is well illustrated by a case recorded by Dr. Rice.‡ Three fatal cases of cholera occurred in a gang of coolies working on the road, 29 miles from Jubbulpore. They fled to a place two miles off, where four more fatal cases occurred within the next two days. They then disappeared. Some ten days after a party of pilgrims, *en route* from Nagpore to the Ganges, encamped for a few hours at the latter spot to cook and eat their mid-day meal, and then came on to Jubbulpore. Two days after resting at the spot, and just after their arrival at Jubbulpore, nine cases occurred among them, three of them fatal.

The second Indian report to which reference must be made, is one to which it is impossible to do justice in the narrow limits of this Report. It is a voluminous and most interesting statistical work on cholera by Dr. Bryden,§ whose name is so well known in this country in connection with the excellent statistical Returns of the Bengal Presidency. Dr. Bryden has taken the statistical Returns of the European Army, of the Native Army, and of the jails in the Bengal Presidency for the last 15 years, and from them has brought

* With regard to the influence of latrines the most contradictory opinions appear to be held by Medical Officers in India, some believing the discharges have no effect, others attributing great influence to them.

† Dr. Murray's Report, Op. Cit., p. 18, Appendix No. II.

‡ Dr. Murray's Report, Op. Cit. Foot note, p. 3.

§ A report on the cholera of 1866–68, by James L. Bryden, M.D. Blue book, Calcutta 1869.

out the conclusions which he thinks the figures warrant. He assumes that the amount of cholera in the Native Army, and in the jails will correctly represent its prevalence among the native population at large. It is very difficult in a few sentences to do justice to this elaborate and careful work, more especially as the way it is put together renders it not always easy to test the statements by the figures. In fact, it would perhaps have been more satisfactory for its readers, if the statistical facts had been simply given first, and Dr. Bryden's conclusions afterwards stated. If I aim at analysis in my own words, it must be with an apology to the author for attempting it in so small a space.

The general result of the whole Report seems to me to carry us back to the views held 30 and 40 years ago in India.

With respect first to the carriage of cholera by infected persons and its communicability in this way from place to place, Dr. Bryden's view is, that such a carriage does sometimes occur, but that it is exceptional, and will in no way account for epidemic outbreaks (pp. 12 and 91); and, indeed, he thinks that such slight outbreaks as occur from such communication die out speedily, unless they happen to correspond with the epidemic diffusion of the disease. This epidemic diffusion owns entirely other causes. In showing what those causes are, Dr. Bryden makes use of certain terms which must be mentioned. Basing his statements entirely on figures, he asserts that the Bengal Presidency may, as regards cholera, be divided into two great areas; in the lower provinces, cholera has a "permanent and perennial abode;" in the upper provinces, the cholera is merely a visitor, as it is in Europe; it is "renewed "by invasion from without." Hence these two sections of the Bengal Presidency are termed respectively, "the area of endemic cholera," and the "area of epidemic cholera" (p. 9). Then, connected with its invasion into the epidemic area from the endemic area, is the fact of periodicity; *i.e.*, cholera invades the epidemic area at intervals with a certain regularity. It has, therefore, a relation to time, and the spread in different epidemics has a considerable amount of parallelism. In connection with its relation to time, is the fact that in upper India the cholera, when epidemic, almost totally disappears from the 1st week in October to the 20th April. There are local exceptions to this, but it is true, as a rule, when large numbers are taken. There is, therefore, something in the upper provinces which in these months limits the spread of cholera, and, indeed, banishes it for the time. In the lower provinces, on the other hand, in eastern Bengal (endemic area), the cholera is most prevalent from October to May (*i.e.*, in the very months when it dies out in the upper provinces), and it is less prevalent in the other months. If, therefore, the statistics of death from cholera were taken for the whole Presidency of Bengal, it would make it appear that cholera prevailed during every month of the year; but separate the Presidency into two great sections, and the remarkable fact comes out that there is a complete antagonism between the two areas, and that one area would give a blank return of cholera in the months when the other area gave a return only too well filled up. Again, when further subdivisions are made, it is found that there are minor areas which suffer in March and April, others after the 20th June, and a third in October, November, and December.

Another relation to time is that in the epidemic area, there are not only certain months in each year when (practically) cholera dies out, but there are certain years when it does not appear at all. These are, therefore, to be contrasted in respect of the epidemic area, years of prevalence, and years of absence.

We may express this relation to time by saying that the cholera of the epidemic area has a certain period of existence, after which it dies out, and then it is never renewed except by invasion from the endemic area, just as on a larger scale it dies out in Europe and then comes to us again, *ab externo*, as a visitor from India, through Russia, or Egypt.

All these facts have long been more or less dearly apprehended, but Dr. Bryden presents them with increased force from the mass of statistics of different epidemics he can array in their support. The effect on the mind of the contemplation of this periodicity, and of the relations of locality and periodicity, is to throw into the back ground the idea of human intercourse being capable of explaining such phenomena.

Looking now again to the characters of cholera in relation to time and place, it is clear from the statistics that the invasion over the epidemic area is made up of a series of outbreaks in different places; and in the same place during the period of the epidemic invasion, there are times of prevalence and times of dormancy, which may be followed by renewed occurrence. Looking to those phenomena, as well as those already noted on the regularity of periodicity, Dr. Bryden concludes, "that the reproduction of cholera in each year is es- "sentially a vital phenomenon proper to the mission of cholera as an object of "natural history. The phenomenon is manifested wherever cholera is met "with, either in its endemic or epidemic provinces. It is the equivalent of "the budding of a tree or the flowering of a plant. The date of reproduction "is regulated by the normal conditions of the geographical position in which "cholera finds itself, for example, the very same reproduction which occurs in "one locality on the 20th February, is delayed in another to the 20th April, "and yet the two are one and the same phenomenon. The duration of each "of these reproductions is the duration of a provincial epidemic outbreak; when "the period for which it has come forward is at an end, the cholera is again "dormant, until its normal period of revival comes round" (p.13).

Before proceeding further a remark may be made on this passage. It will be seen that Dr. Bryden has been driven by his figures to form an hypothesis of the agency which causes cholera. This is in his eyes something vital; when in a place in the endemic or epidemic area it dies out for some months to be revived again at a period proper to each locality, he terms the revival "revitilization," and as will be seen from the above extract, compares it to the renewal of vegetation. It is perhaps a pity that he did not forego the use of any word which suggests an hypothesis until the statistical facts had carried his reader to the limit beyond which conjecture must be used.

Comparing, in respect to this "revitilization" the Punjaub and Calcutta, the following would be the expression of the statistical parts. In the Punjaub cholera becomes dormant, and is capable of "revitilization" only during an epidemic period; in the intervals between two epidemics it so completely dies out that when it again appears a fresh invasion *ab externo* can be always proved (see page 13).*

In Calcutta, on the other hand, Macpherson's figures for 26 years show that though cholera varies greatly it is never absent; it is comparatively dormant, but it revives without fresh introduction, and its periods of revival are singularly constant. In January and in the first part of February it is comparatively dormant; it revives at the end of February and is active till May; it greatly declines in July, August, and September, and revives at the end of October, declining a little during December and January.

Having at great length, and by an analysis of the prevalence of cholera in many districts, determined the facts of periodicity and of the special seasons of reproduction, Dr. Bryden seems next to have considered the attendant phenomena, meteorological, and otherwise. He commences this discussion in his second chapter, but continues it rather irregularly. Taking first the epidemic area and referring especially to the western portion of this, a cholera invading from the endemic area commences at the end of April or generally in the first fifteen days of May, but for six weeks or two months it manifests no great mobility, and only begins to spread greatly in the beginning of July. This exactly corresponds with the monsoon influences. In the eastern portion of the epidemic area the cholera may move as early as March and be a great epidemic in April. In both cases the cholera is evidently related to the monsoon, and is mobile everywhere in Upper India within the influence of the monsoon. In fact, Dr. Bryden connects its movements so closely with the monsoon that he terms it the "monsoon cholera." This is especially the cholera of the epidemic area, and the difference of prevalence in different years is affirmed to be in great part dependent on variations in the monsoon (p. 51).

In the endemic area the cholera appears at different times in different

* I am not sure that I am completely representing Dr. Bryden's views, as he expresses himself rather differently and obscurely. At page 39 it would seem that he thinks the cholera in the epidemic area "is a revitization of the very cholera distributed months and even years before."

parts. In Calcutta, as already stated, the cholera reviving at the end of February is checked, as Macpherson has shown, at the end of May, and thence on to September. This coincides with the rains of the south-west monsoon, which submerge so much ground. But higher up, the margins of the endemic area have their cholera in June, July, and August, when it is least in Calcutta. Speaking broadly, it is with the inundation of vast tracts of country that cholera disappears in Lower Bengal, "and with the reappearance of the "tracts cholera reappears upon the diluvial soil and districts immediately "invaded from it" (p. 61).

It is not necessary to follow Dr. Bryden any further in this direction, for his conclusions may now be stated. The only way (he believes) to explain the fairly regular return of cholera in different places, and its connection with the climatology of a place, is to allow that it must be generated in the soil. The only way to explain its diffusion, which evidently takes place not accidentally but from regular laws, is to believe that it is carried by the wind, provided also that the vehicle of diffusion, viz., moisture, is also present. To use his own words, "The essentials for manifest epidemic progress are three: "(1) the presence of the cholera miasm; (2) the humid atmosphere which is "in every case its vehicle; and (3) the prevailing wind to give direction and "limitation to this humid atmosphere" (p. 87).

Cholera is then supposed to be a miasm which is earth-born and air-carried; its origin is thus connected with vast natural climatological conditions, and its distribution is a phenomenon of meteorological significance.

It has been impossible to do justice to Dr. Bryden's arguments and illustrations in these few lines, and it is difficult to debate the question in the space which can be given to it. And yet it is a question of the greatest hygienic importance, for Dr. Bryden's views strike at the root of the usual preventive measures. A few words are therefore necessary.

It is not easy to be quite certain whether Dr. Bryden's facts prove all his conclusions; at least I have personally found his Report very difficult to read, and to test by his statistics. Still it seems impossible to doubt the correctness of his statistical statements of periodicity of spread and comparatively regularity of local outbreak.

He has in fact grappled with facts which have been long admitted. Every one has felt that the way in which cholera has passed over great tracts of the earth and then disappeared; its curious rise and fall, its periodicity in India, and the way it is tied to certain times of the year, throw great difficulties in the way of accepting the common doctrine that it spreads only by human carriage, without some qualification, or some admission that it is very easily rendered dormant or destroyed.

But on the other hand the extent of even Dr. Bryden's statistics must not blind us to the fact that, as compared with the whole world, even his large tract of country is limited, and his numbers are small. When cholera spreads beyond India and passes beyond the influence of monsoons and Indian conditions it is impossible to account for its mobility by Dr. Bryden's hypothesis. Its spread does not coincide with the wind, but it does coincide with human intercourse. To take only one example. Why, in the autumn of 1865, should Southampton, exposed to the same winds as Portsmouth, or even more protected than that town as it lies twelve miles up an estuary, have been attacked with cholera, while the other great seaport, and every other seaside place over which the wind had passed first, remained unaffected. It is impossible to explain this except by the fact that Southampton and not Portsmouth was the port to which the steamers running from Alexandria and Malta (at that time suffering from cholera) were bound.

So little can the influence of the wind as the mobile cause of cholera be appreciated in Europe that Dr. Baly, after an attentive examination of the subject,* could find so few facts in support of this opinion that he believed that the wafting of the cholera poison through the air to be only a matter of "inference" (*i.e.* not of direct evidence), and he chiefly admitted its action on a limited scale, and for short distances, to account for certain cases of spread which were otherwise inexplicable.

Dr. Bryden's argument that cholera imported by men (a fact which he

* Report of the College of Physicians on Cholera, p. 190, *et seq.*

does not deny) does not spread unless epidemic influences are present, seems to be entirely annihilated by the history of the transport to America. In 1849 it was so manifestly carried by shipping and propagated from the points of arrival that no evidence can be conceived stronger. The same decided evidence was given in 1865 and 1866. Then place beside this the evidence of conveyance by shipping in other parts of the world, and the subsequent epidemics which have followed, and Dr. Bryden's belief that the apparent introduction by men was merely a coincidence with the epidemic diffusion by moist and moving air can hardly be maintained.

Even in India Dr. Bryden's hypothesis meets with phenomena which rudely shake it. The evidence of the dissemination of cholera in 1867 over Northern India by the Hurdwar pilgrims seems as strong as evidence can well be. It is a curious thing that Dr. Bryden had prophesied an epidemic of cholera in that year, which he thought would commence about the 20th of May. The Hurdwar outbreak actually commenced on the 13th. The coincidence between the fact and the prophecy may well be thought at first strong proof of the truth of the data on which the forecast was based, and yet on closer examination the force of this coincidence fades away. Even Dr. Bryden is obliged to allow that the pilgrims carried cholera, only he believes that they merely preceded or, as it were, outmarched the epidemic which was following at their heels, and to which the outbreaks in the towns were really owing. The negative evidence of places which were spared as well as the positive evidence seems quite opposed to such a view.

The conclusion to which I have been led by as careful a perusal of Dr. Bryden's Report as I could give it, is that he has done excellent service by recalling our attention to facts in the natural history of cholera to which European observers have probably attached too little importance. In an hypothesis which is to express the entire spread of cholera we must include such facts as its periodical rise and fall in India. Dr. Bryden has shown, it seems to me, that there is some truth in the old views that cholera is a creature of the ground and may be a denizen of the air, and that it must be influenced by seasons and atmospheric conditions (especially heat and atmospheric moisture), and may travel with the air in some cases to distances not yet precisely determined. But to accept such a view as sufficient to explain all the other phenomena of cholera; to explain its undoubted portability by men and its outbreak in a town or country when thus introduced; the frequent connection of its spread with the intestinal discharges; its propagation by water in many cases, &c., would be simply to put many of the best-ascertained facts of cholera out of court altogether.

The truth probably lies in a combination of all the explanations. The poison of cholera may apparently have an independent life; it may grow in two or three places, viz., in the ground, in the bowels of men, perhaps in water; it may travel in two or three ways; it must be, in European countries at least, destroyed with great facility, and under favouring conditions grow at times with great rapidity. Like many lower organisms it can become dormant and again revive. It appears to me a one-sided view, which can rest satisfied with the contemplation even of the vast climatological influences which Dr. Bryden so well arrays before us, and leave out all the other ascertained phenomena.

Taking this view Dr. Bryden's Report will not in any way affect our preventive measures; we must act against such conditions of spread as are in our power; isolation when it can be done; disinfection and destruction of the cholera discharges; purity of the ground, of the water, and of the air are in no way rendered unnecessary by the fact that in Lower Bengal there may be other conditions less easy to meet, and which may render the destruction of the cholera poison in Bengal more difficult than some anticipate. But even here we will hope that much may be done to destroy the foul breeding grounds of cholera in the moist soil and in the dense native towns, and to make cholera as infrequent a visitor as it appears to have been at the end of the last century.

Since writing the above, a work on cholera, by Dr. Macnamara, of Calcutta,*

* Treatise on Asiatic Cholera, by C. Macnamara, Surgeon to the Calcutta Ophthalmic Hospital. London, 1870.

has been published. In many respects this runs in a very different groove from Dr. Bryden's Report. Dr. Macnamara entirely adopts the view that cholera is communicated by "an organic infecting matter passed with the evacuations of those affected." He argues this point as well as many others connected with the disease with great acumen, and his opinion is the more valuable on account of the way in which he has arrived at it. From an examination of 300 folio volumes of M.S. Reports in the possession of the Medical Board of Calcutta, he has been convinced "that every outbreak of the disease beyond "the confines of British India may be traced back to Hindustan, through a "continuous chain of human beings affected with the disease, or through "articles stained with their dejecta" (p. 322). Dr. Macnamara does not deny the atmospheric and soil influences which act on the cholera poison, but here we have the opinion of an observer who, from Indian experience chiefly, has no doubt of the propagation of the disease by human intercourse. The assisting meteorological influences which Dr. Macnamara dwells upon are the existence of a very moist air, and in this respect he agrees very closely with Dr. Bryden and with many of the old Indian observers. He believes indeed that the only places in which cholera cannot establish itself are the arid plains of a desert.

Dr. Macnamara, however, by no means agrees with Dr. Bryden in his interpretation of these facts, and of the "Monsoon Cholera." He believes that the cholera during the monsoon is distributed in this way. The south-west monsoon "brings with it moisture, a necessary element for the development of "the disease, but more especially because it is before this wind that the large "fleets of country boats move up the Ganges, conveying men and goods from "the home of endemic cholera to be disseminated over the Upper Provinces." Then the decline of cholera in these provinces begins when the rains cease, and the dry west winds of the Upper Provinces set in at the end of September or beginning of October. And he does not accept, for several very strong reasons, Dr. Bryden's opinions of the direct influence of the south-west monsoon in spreading the cholera in the epidemic area. So that, while the facts of the relation to time and season, as stated by Dr. Bryden, are admitted, an entirely different interpretation is given to them, and I cannot but believe an interpretation which is more in accordance with truth. I can only further notice that Dr. Macnamara attributes much influence to the spread by means of drinking-water; he relates (p. 196) a very striking case in which fresh cholera dejections passed into a vessel of water, which was exposed to the heat of the sun during the day; on the following morning a small quantity of the water was drank by 19 persons, one was seized with cholera in 24 hours, two more in 48 hours, and two more about 84 hours after; the other 14 escaped without the slightest sign of illness.

I cannot spare space to extract any more from this admirable work, but recommend strongly its perusal by all.

Two more Indian Reports must be noticed in connection with cholera; one is Dr. David Smith's Report on the Drainage of Calcutta.* All who read it must admit there is no reason to look for any hidden cause of cholera when Calcutta and all the native towns are in a state of indescribable filthiness. But the especial matter of interest at present for us is the authoritative endorsement of a statement made in the Indian Medical Gazette for July 1866, that in the mooring-places off Calcutta certain localities close to sewers have acquired great notoriety for the prevalence of cholera among the crews. "Occasionally cholera makes its appearance in outer ships, in vessels anchored "out in the stream; but its favourite haunts are in the neighbourhood of "certain well-known sewers." Some striking numerical statements and "instances are given of this."

* Report on the conservancy and drainage of Calcutta, by David B. Smith, M.D., Sanitary Commissioner for Bengal. Calcutta, 1869. It is much to be desired that these and similar reports should be more widely known in England than they are. If application for them were made to the Secretary of State for India from the Medical Societies and Corporations with libraries, it is possible they might be granted.

The last Indian Report which I have to notice is one by Dr. De Renzy.*

The subject of cholera in the Punjaub is discussed carefully, and some very striking facts are brought out. Without denying the transfer through the air Dr. De Renzy seems greatly impressed with the truth of the view which attributes the sudden violent outbursts to water-poisoning. Both at Peshawur and Meean Meer, and Rawul Pindee and other places where terrible outbreaks have occurred, he brings facts to show that water-poisoning is far more probable than any other cause. But perhaps the most important evidence in this direction is the case of Murree. This is a hill sanitarium for Peshawur, and is 7,507 feet above the sea. It is naturally extremely healthy. Here two great outbursts of cholera have occurred, in 1858 and in 1867. Dr. De Renzy, from an examination of the water supply, has shown that contamination can hardly be prevented. If a single case of cholera enters Murree "the facilities "for the specific poison of the disease reaching the drinking-water are so "great that it is only by a miracle, or by a most extraordinary combination of "circumstances, that the springs can escape being infected" (p. 104).

This Report is especially valuable for the clear insight it gives into the origin of so many outbursts of cholera among the Europeans in Upper India. It takes us out of the mystical regions of "epidemic distribution" to the firm land of observed and recognised facts.

Enteric Fever.

Propagation by Water.—Dr. Clifford Allbutt, of Leeds, has recorded two excellent cases of the propagation of typhoid fever by water. In one case, at Arkworth, impure water had been used for some time without producing typhoid fever, but a case of the disease having come into the village the discharges were thrown into loose ground, from which water passed into a little stream used for drinking-water. Dr. Allbutt shows conclusively the fact and the mode of contamination. In the other case, that of an outbreak at a large school in Yorkshire, the well used to supply drinking-water was contaminated by soakage from a soft water tank into which sewage matter had passed from a broken water-closet tube. Two of the boys had brought the disease into the school on returning from the holidays, and their discharges had passed into the tank. It is an important fact that only the boys who drank water were attacked; those who drank beer escaped. Therefore, as the water was used for cooking, it would seem that the poison was destroyed by boiling, as otherwise the tea and broth would have given the disease.

Durability of the Typhoid Poison.—Dr Becher (Staff Surgeon) has had the kindness to give me the following facts, which are most important in connection with the duration of the typhoid poison in India, and one mode in which disease may spread.

The fort of Gwalior in India is an isolated rock, and the men stationed there are usually extremely healthy.

In February 1866, a soldier came down from a hill sanitarium and travelled by bullock-dawk, being some time on the road. He entered Gwalior ill on the 5th February, 1866, and it was soon evident he had typhoid fever. There had been some months before a solitary case of typoid fever at Gwalior, but none subsequently. The man died on the 12th February, and on *post-mortem* examination extensive ulceration of Peyer's patches was found. After his death the room in which he died was emptied, the clothes and bedding were thoroughly cleansed, the stone floor was well washed and the room was then left unoccupied for more than a month. It should be mentioned that all the excreta were removed at once, not only from the hospital but away altogether from the rock of Gwalior, as indeed is done with all the sewage matter, so that what occurred afterwards could in no way be attributed to any discharges in or near the hospital, or to the bedding or linen of the patient.

After the room had been thus empty more than a month, a young soldier, who was employed as a clerk to Dr. Becher, but who had not been near the

* Report on the Sanitary Administration of the Punjab in 1868, by Dr. A. C. C. De Renzy, Sanitary Commissioner.

patient, was allowed, at the end of March or beginning of April, to sleep in the room. He brought his own cot and bedding from the barracks. Some days subsequently he complained of not being well, in four or five days typhoid fever was suspected, and he died on the 21st April from bowel hæmorrhage. On *post-mortem* examination, ulceration of Peyer's patches was found. Every cause for this case, which was followed by no other, seems to have been excluded, except the sleeping in the room. The only part of the room uncleansed were the walls and ceiling.

The second patient had not been away from the fort; there was no other case of typhoid there; he could not have derived the disease directly from the first patient, for two months elapsed between the death of that patient and his attack; he could not have derived it from the clothes or bedding, with which he had nothing to do; and in fact all explanation fails, except the supposition that the second case was indirectly derived from the first, and that the medium of the transfer of the "contagium" from one man to the other was the uncleansed walls and ceiling of the room. This case seems to indicate that the typhoid poison may adhere to walls, may be undestroyed in a month, even with free ventilation, and is not rendered powerless by a high temperature.

The Parasitic Origin of Disease.

Owing to the length of this Report, and for other reasons, it is desirable to defer the full consideration of this subject until next year. I will only refer to one or two publications, and to a few points of interest.

Professor Hallier, of Jena, has commenced the publication of a journal devoted to this subject.* Two numbers have appeared, and it seems likely to be a very useful serial. With respect especially to the lowest cell life, a work† has been published by Professor Karsten, of Vienna, which is just now of much interest. The relations of yeast-cells, micrococci, microspores, vibrinones, &c., are discussed, and numerous cultivation-experiments are related. Karsten expresses a decided opinion, with respect to the "yeast-cells" (Hefezellen) and the other forms above enumerated allied to them (which are assumed under different conditions of nourishment, and which can be developed from the young commencements of cells of many plants and animals), that the variations of form in no way represent independent species of plants. Indeed he is convinced that "these cell-vegetations are not to be reckoned as "species of either fungi or algæ" (p. 64). He distinguishes these forms from the very similar hypho- and conio-mycetes, inasmuch as they cannot again resume the highest developed form of the plant from which they arise. They are distinguished also from the nearly-related hypho- and conio-mycetes by their mode of life, for they are parasites, and often feed on living organisms; while the hypho-mycetes, if they spread on living bodies, are usually nourished by dead matter.

To these bodies, Karsten attributes great importance in spreading disease. After referring to the action of fungi on the skin, he says (p. 89):—

"Without doubt, it is also similar with the yeast-cells which have arrived "in the interior of the bodies of men and animals; and it must not be forgotten "that the cells also of the animal body, diseased by the yeast-vegetations in "their vicinity, develop vibriones very similar in their outward appearance "to those of plants; that also they change into micrococci, sarcinæ, pus, "yeast, &c.; and according to their nature as poisonous contagions (sausage-"poison, cadaveric poison, syphilitic pus, &c.) can work on sound bodies, and "still more on those whose functions are already weakened by previous "irritation."

And so also he thinks it is quite possible that similar actions may lead to endemic and epidemic diseases. But here he says "all is yet to do"; and he advises a continual careful study of the power of assimilation of the cells and

* Zeitsch. für Parasitenkunde, von Dr. E. Hallier and Dr. F. A. Zurn. Band 1, Heft 1 and 2. Jena, 1869.

† Chemismus der Pflanzenzelle, von Dr. H. Karsten, Professor der Botanik in Wien.

of the morphological and chemical changes of the elementary organs of living creatures resulting therefrom.

Leaving these difficult problems, I will allude only to two or three points of interest in connection with parasitic diseases.

I can only refer now to a very interesting Appendix to his great work on Entozoa lately published by Cobbold. It is conjectured that the cysticercus of the sheep is different from those of the ox and pig, and gives rise to a smaller tæmia. There are many interesting experiments with tæmia and trichina, and a careful description of pseudentozoa. A complete account is given of the entozoa of the dog.

Tropical Chlorosis.—The so-called "Anchylostoma disease," *i.e.* the Egyptian chlorosis, or the disease dependent on the presence, in the duodenum of the dochmius (or strongylus or anchylostomum), has received some more discussion during the past two years. A case is given by Dr. da Rocha, of Rio de Janeiro,* which was diagnosed as "Cachexia paludosa," but after death a great number of the worms were found adherent to and boring into the duodenal mucous membrane.

Hirsch† quotes from Grenet (Archiv. de Med. Nav. Imp.) two cases of "tropical chlorosis," or Cachexia Africana, observed at Madagascar, and found to be dependent on the anchylostomum in the duodenum and jejunum. Hirsch also quotes‡ a paper by Riou-Kérangel, § who has observed this disease in a great number of cases of "tropical chlorosis" in all races—negroes, coolies, Arabs, and Chinese, and also in Europeans. He found the worms reaching from the pyloric orifice to the cœcum, but never below the valve; in two cases they were in the stomach. It has been supposed that the disease of the negroes, called in French Guiana, "Mal de Cœur," is in reality the same affection.

It is much to be wished that careful investigation of cases of chlorosis or anæmia on the West Coast, in the West Indies, and India, should be undertaken. The discovery of the cause of this peculiar chlorosis is a great gain to pathology.

Favus.—An abstract is given in Virchow's "Archiv"‖ of an investigation by Hoffmann (Bot. Zeitung, 1867, No. 31) of the Favus-fungus. The cultivation-experiments of fungi taken from the crusts and also from the roots of the hairs showed two fungi: one derived especially from the crusts was the common penicillium glaucum, one from the basis of the hairs was the mucor racemosus of Fresenius; but this cultivation did not always succeed. The mucor racemosus is considered to be the essential fungus of Favus, while the penicillium is accidental. The disease spreads, Hoffmann thinks, by spores or conidia falling on the point of exit of a hair; the growing fungus, passing downwards, soon strikes on the young unhardened epithelium cells of the Malpighian stratum, and finds there abundant nourishment. Hoffmann thinks creosote and oil of turpentine the best application; fatty inunctions with fungus-killing applications are not practical, as the fat penetrates with difficulty into the watery cell-fluids.

Hallier has noticed the aspergillus as well as mucor in Favus.

Fungi in Cattle Diseases.—At the end of a Report on the Cattle Disease in the United States¶ is an account of an investigation by two officers of the United States' Army, Dr. Billings and Dr. Curtis, of the fluids of diseased cattle. The authors detail, in the first place, their mode of investigation and the precautions taken to prevent the entrance of spores or other bodies *ab externo*. They collected portions of blood, bile, &c., in what they term a "vacuum tube"; this is a glass tube 3-16ths of an inch in diameter, closed at one end and drawn out to a point at the other; it is then heated to redness in a spirit-lamp, and while so heated the small opening is sealed. The red heat is sup-

* Archiv der Heilkunde, vol. 9, p. 178. 1868.
† Jahresb. für ges. Med. for 1867. Band 1, p. 409.
‡ Jahresb. für ges. Med. for 1868. Band 1, p. 295.
§ The original paper is in the Archives de Med. Navale, Oct. 1868.
‖ Band 42, p. 447.
¶ Reports of Diseases of Cattle in the United States made to the Commissioner of Agriculture. Department of Agriculture. Washington, 1869.

posed to have destroyed all organic matters in the air, and when the tube is plunged in blood or other fluid to be examined, and the small point is broken off in the fluid, the fluid rushes into the vacuum without being exposed to the air. The tube being again at once sealed, the fluid is preserved unchanged.

The following fact shows how completely the virus thus preserves its power:—On the 26th February, 1869, a cow was killed in the last stage of pleuro-pneumonia. In the bronchial tubes were blebs formed by a false membrane filled with serum. Some of the serum was put in a vacuum tube. In April 1869 (exact date not stated), cattle inoculated with this serum got pleuro-pneumonia.

The fluids thus carefully collected were examined with high powers (1,200 diam.), and cultivation-experiments were also made in a method based upon that of Hallier, but avoiding some of the possible fallacies. As material or substratum for the growth, they used extract of beef, healthy blood, condensed milk, solutions of cane and rape sugar, pulp of lemon, orange, potato, &c. A little tartrate of ammonia and ashes of yeast were added to the solutions of sugar.

The result of many experiments with the blood and secretions of the "contagious pleuro-pneumonia of cattle" was to show, in the words of the authors, "that there is no peculiar fungus present in the blood or secretions, "the theory of its cryptogamic origin is untenable" (p. 181).

The blood and secretions from animals dead of the splenic (Texan) fever were also examined. The authors discovered in the blood, bile, and urine, the minute bodies (bacteria or micrococci) from which fungi could be reared, but these fungi were always the common kinds, and therefore they failed in establishing "the presence of any peculiar or special cryptogamic germs in "the blood; and instead of supporting the notion that the micrococcus "granules which are present in any way cause the disease, the experiments "tend rather to show that their occurrence should be considered as an effect "of the malady."

The authors also criticise the Report of the New York State Agricultural Society, which contains a Report of the Metropolitan Board of Health. In this Report are some investigations by Hallier on fluids sent to him from America, on which the authors remark as follows:—

"The conclusions of Professor Hallier we do not accept for three reasons: "first, because the fluids sent to him were not put up with the proper pre- "cautions for exclusion of extraneous spores; second, because the culture "apparatus used by him does not give reliable results, as we have found by "experiment; and, lastly, because his reasoning is based on a peculiar theory "of his own, that penicillium, mucor, &c., are merely unripe forms of certain "ustilagineous fungi—a theory which cannot be discussed here, but of which "it is sufficient to say that it has been accepted by no other prominent "mycologist" (p. 185).

At the end of their paper, the authors narrate some interesting experiments on the separation of yeast-cells and the various organisms of putrid fluids. They observe that "bacteria, vibrios, and molecules, either single "or in chains (Monas, Microzymas, Micrococcus, Leptothrix, Zoogloea, and "Schizomycetes of various authors), will readily pass through thoroughly "moistened filtering paper; while, as originally shown by Mitzscherlich (Pogg. "Annal. 1855, p. 224), and again proven by the following experiments, yeast- "cells will not. Furthermore, none of the above-mentioned bodies will pass "through vegetable parchment, although fluids will" (p. 187).

Fluids containing morbid blood and other fluids from diseased animals, being put into a tube covered with paper or parchment, and placed, with the paper downwards, in a beaker containing a fluid prepared with cane-sugar and extract of beef, or tartrate of ammonia and ashes of yeast, the beaker was now hermetically sealed with a cover of thin sheet indiarubber. Bacteria and micrococcus passed through the paper, and it is believed developed into yeast-cells, so that the authors think it is probable that bacteria are really fungoid in character, but they state this with some doubt and reservation.

They also are of opinion that the minute organisms, classed as bacteria or micrococcus, may not all be of the same character. They have observed that solution of sulphate of quinine stops the movement of bacteria, while

strychnine has no particular effect. They have seen bacteria quite lively 24 hours after being placed in a solution of two grains of carbolic acid to an ounce of water, while in other cases they saw solution of carbolic acid at once arrest the movement.

The final result of all the experiments is thus given :—

"In many animals, whether healthy or diseased, there are no fungus germs "in the blood; we have kept vacuum-tubes of blood for four months, and at "the end of that time the contents were perfectly normal. In other animals "there are probably germs in the blood during life, as shown by the fact that "in vacuum-tubes filled from them the blood putrefied, and the usual "mycoderms developed. . . . . The fungi which are developed from "blood containing these germs are, as might be expected, the common molds, "the spores of which are almost ubiquitous; most frequently penicillium, "next mucor, next aspergillus. . . . . The query as to the connection "between these forms and disease—whether they should be considered as "specific causes of the disease or as carriers of contagium, or as the signs of "destruction of vitality of a part of the fluids or tissues in which they are "found, said destruction being due to some other cause—is one of great inte-"rest, but for the answering of which the 'lancet and injection-tube' will "probably be far more efficacious than the microscope and 'culture appa-"ratus'" (p. 190). A plate is given of the forms of fungi observed.

It will thus be seen that the authors trace all the forms of fungi seen in the blood and fluids in the pleuro-pneumonia or splenic disease of cattle to common forms, and that they entirely differ from Hallier on this point.

APPENDIX, No. II.

REPORT ON DR. HASSALL'S FLOUR OF MEAT.

By E. A. PARKES, M.D., F.R.S., Professor of Hygiene in the Army Medical School.

THE Director-General having desired that Dr. Hassall's flour of meat should be examined at Netley, for the purpose of seeing how far it might be used as a diet for healthy soldiers in war, or for sick persons, the following experiments were undertaken.

The following is the order of the Report:—

1. Chemical Examination.
2. Microscopical Examination.
3. Practical Trial on Healthy Persons.

Two gentlemen (Dr. Notter, of the Queen's Service, and Dr. Coul Mackenzie, of the Indian Service) volunteered to conduct the practical trials. These gentlemen lived themselves on the food, and in addition to weighing and measuring all articles of food, weighing themselves, and noting all deviations from health, collected and examined the urine. They furnished me with elaborate Tables on all these points, from which those given further on are abstracted.

Composition and Chemical Examination.

Dr. Hassall has been kind enough to give me a good deal of information on the mode of preparation.

The flour of meat, as it is sold in the market, is prepared as follows:—Fine meat is chosen, and all visible fat removed; the interstitial fat is left; it is then carefully dried at a low heat, torn up, and reduced by machinery to a powder without grittiness. In this state it is said to contain very little water; it is a pleasant-tasted brownish powder, but does not mix well with water, and even after careful warming, sinks in water. Before being sold, it is therefore mixed with some other substances, viz., a little colouring matter, chiefly burnt sugar, similar to that used for colouring soups, with what is called French mixture, which consists chiefly of salt, pepper, and a little spice, sugar, and arrowroot. The usual proportions are 86·5 per cent. of the meat, 3¼ per cent. of arrowroot, 2½ per cent. of sugar, and 3 per cent. of French mixture (salt, pepper), spices, and colouring matter.

In this state it is sold for making beef-tea, and the meat-flour is also mixed with wheat-flour, or with cocoa or other substances, to form cakes and biscuits.

The taste of the beef-tea powder is pleasant, and the beef-tea is fairly palatable when well made, though it is not liked by all. The biscuits are very pleasant.

The powder for beef-tea keeps for some time (several months), but at last decomposes, even when kept in a tin case not hermetically sealed.

I have analysed three specimens of the commercial powder, and found the composition as follows:—

	No. 1.	No. 2.	No. 3.
Water	9·231	15·3	13·5
Nitrogen	8·397	8·775	9·258
Fat	10·670	12·3	10·
Salts { Soluble	1·794	3·6	4·2
Salts { Insoluble	1·861		

The mean of the three analyses gives,—

Water	12·68
Nitrogen..	8·81
Fat	10·99
Salts	3·82

If the nitrogen be reckoned as an albuminate, it would amount to 55·5 per cent.

Dr. Hassall's own analysis of the pure meat states that there are in 100 parts,—

Albumen	14·6
Fibrine	45·3
Gelatine	13·2
	73·1

But in this case the meat is the fine meat, and is considered to be without water. If a correction for the 12½ per cent. of water which was present in my three samples, and for the added arrowroot and sugar and colouring matter, be made (that is to say, by deducting from the pure flour 13·5 per cent. for the substances added, and 12·68 per cent. for the water in the three samples), my three experiments contained, on an average, 74 grains of pure water-free meat-flour; and the albumen, fibrine, and gelatine in this would amount (if Hassall's numbers be adopted) to 54 grains. This agrees very closely with my results, viz., 55·5 grains.

Assuming again that all the nitrogenous substances are equally nutritious, though this is not quite the case, 100 grains of Hassall's powder for beef-tea, as sold in the market, would contain,—

	Nutritive Value per cent.
Water	12·68
Albuminates	55·5
Fat	10·99
Carbo-hydrates, colouring matter, spices, &c. ..	17·01
Salts	3·82
	100·00

In an ounce (437·5 grains) there would be 38·5 grains of nitrogen. If it were desired to give 300 grains of nitrogen daily, it would be necessary to give 7¾ ounces of the commercial flour of meat, provided it were the only nitrogenous food.

If a lb. of bread, which contains on an average 61 to 70 grains of nitrogen, were given, it would be necessary to issue 6 ounces of Hassall's food per diem. If peas or beans or cheese, or other highly nitrogenous substances, were also allowed, the necessary amount of Hassall's food would be of course lessened in proportion.

The amount of fat in Hassall's food is rather small, and either butter or fat bacon would have to be added.

The free acidity of the commercial meat-flour was equal to 1·8 grains of lactic acid ($C_6 H_5 O_5 + H O$ old notation) in 100 grains, but it is probable that some of the acidity was due to acid phosphate of potash.

Microscopic Examination.

Small fragments of muscular fibre, some with the cross striæ destroyed, others showing them very beautifully, and arrowroot starch cells, were the principal objects seen. There was a small quantity of vegetable cellular tissue, probably from the spices.

Practical Experiments on Healthy Persons.

As the two gentlemen who were about to make the experiments were extremely careful and accurate observers, it seemed a good opportunity of making a few observations on diet generally, as well as on Hassall's food in particular. Each gentleman lived for seven days on a regulated diet, and determined the amount of the urea, and some other urinary constituents, during this time.

EXPERIMENTS ON DR. NOTTER, ÆT. 22.

During seven days, the mean weight of this gentleman was 170·7 lbs. avoirdupois, the variations being from 172 to 169 lbs. The mean pulse was 79, with variations from 84 to 78. The mean temperature of the body was 98·66°, but it was slightly heightened on three days by an attack of catarrh.

During seven days, this gentleman took the following daily diet:—

	ozs.
Cooked meat	7·5
Bread (as bread and as bread puddding) ..	10·5
Butter (as butter and in pudding)	2·64
Potatoes	6·3
Eggs (3½ weight, after allowance for shell) ..	6·3
Milk (as milk and in pudding)	12·7
Sugar (as sugar and in pudding)	4·2
Total	50·14

He also drank 59 ounces of fluid, either in the form of water, tea, coffee, or beer; the last in small quantity. The total food ingesta were 109·134 ounces avoirdupois.

The calculated nutritive value of this diet is,—

	ozs. avoir.
Nitrogenous substances (= nitrogen 322·6 grains)	4·647
Fat	4·921
Carbo-hydrates	11·715
Salts	·59
Total water-free food	21·873
Water in so-called solid food	28·261
Total so-called solid food	50·134
Water in drink	59·
Total food-ingesta	109·134

The ingesta for each lb. of body-weight were (nearly)—water-free food, 0·127 ounces; water, 0·510 ounces; total, 0·637 ounces of ingesta per lb. of body-weight.

Almost precisely the usual quantity of water was taken per lb. weight, and the water-free food was almost as usual, the average supply being about ·15 ounces per lb. of body-weight. The metamorphosis of tissue appeared therefore to be perfectly normal in this gentleman.

The weight of the water-free food to the water was almost precisely as 1 to 4.

The fats in this diet were large, corresponding to what I have noticed, viz., that active young men, taking what food they like, always take more fat than the quantity usually stated by writers on standard diets. Corresponding to this, the carbo-hydrates are rather small.

During these seven days, the condition of the urine was as follows:—

	Water in cubic feet.	Sp. Gr.	Urea in grains.	Chloride of sodium grains.	Free acidity equal to grains of oxalic acid (C_2O_3 + 3 H O, old notation.)
Maximum	1,700	1,028	628	281	66·1
Minimum	900	1,018	420	127	33·0
Mean	1,254	1,022	521	164	45·4

The action of the bowels was quite normal on six days; on one was slightly less.

The skin acted freely.

On two days there was a little catarrh and slight tonsillitis, which raised the temperature of the body, but had no effect on the pulse. The urine was not affected, unless an unusual high acidity, when the catarrh was passing off, was connected with it.

These experiments having given a general idea of the amount and kind of food required by this gentleman, Hassall's flour of meat was then given with bread and salt, but with nothing else, except a small quantity of arrowroot to suspend the meat, and a little sugar in the tea.

The object of this experiment was not, it must be clearly understood, to ascertain the value of Hassall's food when properly used, but to see the effect which would be produced, if, during war, rations of the flour of meat, with bread or biscuit, were served out as the only rations for the soldier. The result which actually occurred was anticipated. Neither Dr. Notter nor Dr. Mackenzie preserved their health, even for three days, on this diet. This was not owing to deficiency of nitrogen, for the further experiments showed that the fault was not there, but to want of the fat and carbo-hydrates, and to sameness in the kind of food.

It was determined to give 300 grains of nitrogen daily; and as the flour of meat contained 8·3976 per cent., and the crumb of the bread was found to contain 1·43 per cent. of nitrogen, 5 to 6 ounces of Hassall's food and 1 lb. of bread would have been sufficient, and would have given 300 grains of nitrogen. Dr. Notter, however, did not like the food; and during four days could take only 17 ounces of the flour of meat, and 25 ounces of bread. This gave a daily ingress of nitrogen of only 195·24 grains. The fat and carbo-hydrates were in very small amount. The exact food taken (omitting the non-nitrogenous and non-fatty substances in the meat) was,—

	ozs. avoird.
Nitrogenous substances (= nitrogen 195 grains).	2·81
Fat	·55
Carbo-hydrates in bread, sugar, and a little arrowroot	5·8
Total water-free food	9·16
Total water taken in food and as drink	41·59
	50·75

To 1 lb. of body-weight there were,—water-free food, ·053 ounce; water ·24 ounce.

The effect on the health of this small and imperfect diet was immediate, and is well described in the annexed letter. It is worthy of special remark that, among other symptoms, there was an eruption like acne; and, as will be seen, Dr. Mackenzie suffered from a like attack.

The effect on the urine was as follows :—

	Water in C. C.	Urea grains.	Chloride of sodium grains.	Acidity (= $\bar{O} + 3\,H\,O$) grains.
Mean daily excretion during 4 days ..	1,670	392·26	111	40

The increase in the amount of urinary water, although very little fluid was taken, was singular. The average urinary water during the previous period, when 87 fluid ounces were taken daily, was 44 ounces; while in this period, when only 41½ ounces of water were taken, 58 ounces of urine were passed. This was possibly owing to the condition of the bowels, which were throughout constipated. The mean weight of the body, during this time, was very con-

stant; it was 171·2 lbs., or ½ lb. more than during the previous period of larger diet. The temperature of the body was 98°.

The constancy of the weight of the body, with the very small amount of food, showed that the egesta must have been very much lessened; this is apparent in the urea and in the bowel excretion. Possibly also the pulmonary exhalation was lessened. Taking these facts, with the simultaneous derangement of the health into consideration, I can draw no other conclusion than that there was a considerable derangement of nutrition, and a depressed metamorphosis of tissue. As regards the elimination of nitrogen, 195·24 grains, as determined by direct experiment, went in daily with the food, and 183 grains passed out with the urea. Allowing that 1-12th of the nitrogen in the food, or 16·27 grains, passed off by the bowels, the amount to be excreted by the urine would be 178 grains, or almost the same as that actually calculated from the urea. There was therefore no evidence that the nitrogenous tissues were wasting, and this agrees with the fact that the body-weight remained unaltered.

As soon as it was seen that the food given in this way did not answer, and that in any future war health will not be maintained if only Hassall's flour of meat and bread be given, a third series of experiments was commenced, and was continued for four days. Hassall's food was still given in place of meat, but a little butter, sugar, milk, and potatoes were added to the diet.

The diet during these last four days was as follows:—

	ozs. avoird.
Hassall's flour of meat	5
Bread	6
Potatoes	6
Milk	·69
Butter	·75
Sugar	4
Arrowroot	·25

He drank, as before, 39 ounces of tea.

The nutritive value of this diet was therefore,—

Nitrogenous substances (= nitrogen 229 grains)	3·299
Fat	1·338
Carbo-hydrates	10·804
Salts	·311
Total water-free food	14 752
Water in food	7·755
Water as drink	39·
Total water	46·755
Total food ingesta	61:507

As the average weight of the body, during these four days, was 169·8 lbs., 1 lb. of body-weight received,—water-free food, 0·087 ounce; water, 0·273 ounce.

Although this diet was, as might be expected, insufficient to maintain the body in its full vigour, the uncomfortable symptoms, with the exception of dyspepsia, were relieved; the action of the bowels, previously constipated, became normal; the acne disappeared; still there was a feeling of weakness and indisposition for exertion. It is clear, indeed, that though the increase in the total quantity, and still more in the amount of fat and carbo-hydrates, had greatly improved the health, a larger amount of food would have to be given.

During the three first days of the trial, the urinary excretion was as follows:—

	Water in C. C.	Sp. gr.	Urea.	Chloride of sodium.	Acidity, = grs. of O.
Oily excretion	1,157	1,020	470·78	150	26·86

The nitrogen passing off as urea amounted to 222 grains, while the nitrogen in the food was 229 grains, or, deducting 1-12th for the nitrogen of the bowels, almost exactly 210 grains had to be excreted by the urine; but it is probable that a smaller amount than 1-12th passed off by the bowels, as the food is so easily digested. The amount of urinary water fell considerably over the quantity in the previous period.

It was indeed evident, both from these figures and the effect on the health, that the tissue-metamorphosis was becoming normal, and that the diet was, except in quantity, a proper one.

I subjoin Dr. Notter's account of the effects on himself.

Observations by Dr. Notter on his Experiments.

"The object of these experiments on Dr. Hassall's flour of beef was to "ascertain whether it would supply nutrition enough to keep the body, under "ordinary circumstances, in a full state of health, and whether it would, in "cases of urgency, be sufficient diet for soldiers, should their ordinary supplies "of diet fall short, or the events of war render it impossible for them to obtain "them; and first I have measured what was the amount of ordinary diet "which I consumed daily, and secondly I have substituted for it the concen-"trated flour of beef. I have endeavoured to make the amount of exercise "which I took as uniform as possible.

"I commenced living on the preserved meat, the first time, on the 5th of "July. On the morning of the 8th I began to feel the effects of the diet, "which were shortly these:—Slight giddiness, dyspepsia, inability to pursue "my usual duties; a feeling of langour, and no appetite for food; desire for "fats, especially milk, was intense; and my gums were slightly tender. Acne "appeared on my face, and I did not feel at all well. On the morning of the 9th "all these symptoms were somewhat intensified. On that day I increased my "diet by adding butter, potatoes and sugar. All the symptoms which I pre-"viously suffered from were more or less relieved, with the exception of the "dyspepsia; still I found the diet I was eating quite insufficient to enable me "to go through my ordinary work with any degree of comfort. The flour of "beef I found to be very insipid, even with the addition of salt and pepper. I "think, when used *merely* as a substitute for meat, it would form an excellent "diet for a short time; but, as far as my experience goes, it is *not* sufficient, with-"out vegetable food and fats, to support a man under any exertion whatever."

Experiments on Dr. S. C. Mackenzie, æt. 23.

During seven days this gentleman lived on ordinary diet; his average weight was 135·89 lbs. avoirdupois, but varied from 134¼ to 137¾ lbs. The average pulse was 74½, the average number of respirations 20.

The daily diet was as follows:—

	ozs, avoird.
Cooked meat	11·15
Bread (as bread and in pudding)	12.20
Butter (as butter and in pudding)	2·85
Potatoes	6·59
Milk (as milk and in pudding)	9·50
Sugar (as sugar and in pudding)	3·39
Total solid food and milk	45·68
Water (as water and in coffee)	46
	91·68

The nutritive value of this diet is as follows:—

	ozs. avoird.
Nitrogenous substances	4·660
Fats	4·850
Carbo-hydrates	11·750
Salts	·633
Total water-free food	21·893
Water in food	23·64
Water as drink	46·
	91·533

Calculated according to body-weight, 1 lb. weight of body required,—o water-free food, 0·16 ounces; of water, 0·51 ounces.

These proportions are, as in the case of Dr. Notter, quite in the normal range.

During the seven days the bowels were quite regular; the health was perfect; average daily exercise to the extent of 15 miles was taken.

The daily urinary excretion was as follows :—

	Water in C. C.	Sp. Gr.	Urea grains.	Chloride of sodium grains.	Free acidity by grains of ϕ.
Maximum	1,370	1,026	559·7	225·7	42·4
Minimum	800	1,020	401·4	113·7	25·6
Mean	1,041	1,024	471·3	172·	32·7

Dr. Mackenzie then commenced Hassall's food, and took, in four days, 19 ounces, with 41 ounces of bread, 8 ounces of sugar, and a little arrowroot.

The daily nutritive value was,—

Nitrogenous substances (= nitrogen 238·5 grains)	3·435
Fats	·656
Carbo-hydrates	7·610
Salts	·157
	11·858
Water in food	3·636
Water in drink	21·750
	37·244

The weight during these days averaged 136·56 lbs., being a little higher than in the previous seven days. 1 lb. weight of body received 0·086 ounces of water-free food, and 0·185 ounces of water. The bowels were regular on the first day, relaxed on the second, and much confined on the two last days. The general health was much affected, there was great dyspepsia, and a papular eruption appeared on the face.

The condition of the urine was as follows :—

Average.	Water in C. C.	Sp. gr.	Urea in grains	Chloride of sodium in grains.	Free acidity in grains of O.
Excretion in 24 hours	1,407	1,017	461·6	111·4	37·8

As in the case of Dr. Notter, the urinary water was increased, although much less liquid was taken, nor did the transient diarrhœa on the 7th July at

all affect it; the urine amounted to 1470 C.C. on that day, and 1410 C.C. on the following.

The fall in the urea was less marked than in Dr. Notter's case, and the free acidity increased; possibly this may have been connected with the acid dyspepsia. As regards the nitrogen, 238·5 grains entered with the food, and 215 grains left by the urea; the remaining 23½ grains passed out chiefly, no doubt, by the bowels.

An alteration was then made in the diet; potatoes were allowed, and on one day strawberries were taken.

The daily diet was,—

	ozs. avoird.
Hassall's food	5
Bread	8·5
Potatoes	4·25
Sugar	2·
Butter	·125
Arrowroot (taken as drink)	·25

Omitting the strawberries, the daily nutritive value was,—

Nitrogenous substances (= nitrogen 240 grains)	3·465
Fats	78
Carbo-hydrates (in bread, sugar, and arrowroot)	7·67
Salts	·19
Total water-free food	12·105
Water in food	6·62
Water in drink	21·
Total food ingesta	49·725

The mean weight, during these four days, was 135·18 lbs., being only ·71 lb below the weight of the period under normal diet; but at the end of the four days the weight was lower than at any time during the fifteen days' observation, being only 133·25 lbs. He was possibly beginning to lose weight at the close of the experiment.

The amount of food ingested to body-weight was,—1 lb. weight of body received 0·089 ounce avoirdupois of water-free food, and 0·2 ounce of water. The bowels acted regularly.

The urinary excretion was,—

	Water.	Sp. gr.	Urea.	Chloride of sodium.	Free acidity in grains of O.
Mean amount in 24 hours	1,110	1,018·5	455·5	111	29·8

The nitrogen passing off as urea amounted to 212·5 grains, that entering the body as 240 grains.

During these four days, all the dyspeptic and other symptoms passed off, and the health became excellent. The urinary water fell almost to the amount excreted in the normal period. The free acidity, which had been large in the dyspeptic period, lessened even below the amount during the first period of normal diet.

I subjoin Dr. Mackenzie's note on the effect of the diet on himself.

DR. S. COUL MACKENZIE'S ACCOUNT OF THE EXPERIMENTS ON HIMSELF.

"The following is the result of the experiments which I tried on myself, "at your request, with Dr. Hassall's concentrated flour of beef; the object in "view being to ascertain whether it had sufficient nutriment to support a

" healthy person, so as to be useful during war as a light and portable food for " the soldier. I commenced the experiments with the concentrated food on " the 5th of July, 1866, being then in perfect health. I lived daily on 5 ounces " of this meat, a few ounces of bread, sugar, tea, and water (for exact quantities " *see* Table) until the morning of the 9th. During that period my employment " consisted of the usual duties, viz., attending lectures, wards, reading, &c. " My exercise was about 15 miles per diem on four days, and less on the three " others. I enjoyed good health till the morning of the 6th, when I had a " severe attack of choleraic diarrhœa, but not severe enough to prevent me " from performing my duties. From the afternoon of the 6th to the 9th I " suffered from acid dyspepsia, a feeling of intense langour, and inability for " any mental exertion. I was also constipated from the 7th to the 10th. On " the third day a papular eruption appeared on my face and neck, and dis- " appeared on the following day. About this period I had a craving for vege- " tables. I then continued the food with the addition of 6 ounces of potatoes. " This had a wonderful effect: my bowels became regular, the troublesome " dyspepsia disappeared, I was able to read more, and performed my duties " satisfactorily. From the results of the experiments, I am of opinion that the " food is able to support animal life for a short period without the addition of " vegetables; but if continued for any length of time, these must be added. " The great objection, however, was its unpalatableness to my taste."

Conclusions.

It must be understood that these experiments are not at all condemnatory of Hassall's food when properly used. They show simply that a ration of bread and of Hassall's food will not suffice to nourish the body properly, and consequently would not maintain the soldier in health during war. Nor would anything have been gained by increasing the supply of Hassall's food. As it was, the two gentlemen could not take all they might have had; and it can scarcely be doubted that if they had taken any larger quantities, the injurious influence on their health would have been rather greater than less, for their illness was evidently not owing to mere defect in the quantity of the food, but to want of essential parts of diet. When a few potatoes were given, and a little more fat, the health became at once re-established. It is curious, certainly, that a diet of bread and fresh meat alone does not produce (at least I am not aware that it does) this great effect in nutrition that Hassall's food did. It may, however, have the same effect, which may have been merely overlooked.

The effects produced on these two gentlemen were evidently the same in each case. In addition to great dyspepsia, there was manifestly some check to tissue changes; and the eruption of acne showed that there was retention of partially effete substances in the body, although as much nitrogen passed out as entered the body. Had it been possible to have determined the amount of oxygen absorbed into the body during the period, some light might have been thrown on the nature of the alteration in the formation and destruction of tissue.

The effect on each gentleman, on the addition of the other articles of diet (vegetables, fat, and a little more starchy food) was described by both as perfectly marvellous; and it will be seen by the Tables that the improvement was not owing to increase in quantity, but to alteration in dietetic composition.

With this addition, Hassall's food seemed to answer every purpose. The only objection seemed to be that it was not very palatable. This is no doubt, to some extent, a matter of individual taste; but the fact that it was rather disagreeable to both these gentlemen seems to show that that may possibly be an objection to it, which would have to be overcome by careful cooking.

The portability and freedom from change (except after a very considerable time), and its undoubted nutritive powers, render it, in my opinion, a goodfood for soldiers under certain conditions, viz., when bread, fresh vegetables, rice, and fat in some form can be given.

Under these circumstances it might be used; and if alternated with preserved meat, and occasionally with salt meat, it would become an important food in war, when fresh meat could not be obtained.

APPENDIX, No. III.

OBSERVATIONS ON THE AIR OF BARRACK-ROOM 124 B., SOUTH WING, ROYAL VICTORIA HOSPITAL, NETLEY, ON THE NIGHTS OF JULY 9TH AND 10TH, 1869.

By R. TEMPLE WRIGHT, M.D., F.R.C.S., England, Medical Candidate.

Object.

1. THE object of the examination was an exercise in practical Hygiéne, and a desire to compare the present condition of the ventilation with that described by Mr. L. C. Nanney in the Sanitary Report for 1865, p. 467.

Result.

2. Deterioration was to be expected from the greater length of time that the shafts, &c., had been in operation, and improvement from the smaller number of occupants. Both expectations were realized, the improvement decidedly preponderating.

Condition of Room.

3. The men were not informed of the intended visit, so the condition discovered may be considered their normal state of existence.

The season being midsummer, observations were taken only during the hours when they were perfectly quiescent, *i.e.*, from 11 P.M. to 4 A.M. Their urine-tub was outside in the verandah, they had not been smoking indoors, and only one gas-burner was lighted, yet the atmosphere was rather close, though not enough to be called oppressive. Ten men slept in the chamber, and one man awake was left to attend to the aspirator, so the report has been made with 11 men actually present.

Usually the men are quartered here, but six spare beds are kept ready for probationers who come to Netley to be trained for the Army Hospital Corps; then the room is overcrowded, as appears in Mr. Nanney's Report.

I entered the room every hour with Serjeant Sylvester, Army Hospital Corps, who assisted me in making the observations, but our visits were so short that the air we admitted by opening the door on our arrival and departure has been considered to compensate for the excess of carbonic acid by our presence.

Means of Ventilation.

4. The means of ventilation were as follows:—

(A) One door open intermittently.

(B) One door shut constantly.

(C) Seven windows, one being only a single row of panes over the door, not opening at all.

Inlet.—One on the west side was open for a foot at the top, admitting 3,852 cubic feet of air per man per hour. Inlet = 4 feet × 1 foot. See Table I.

Outlets.—Two on the east side were open at the top four inches each (= 4 feet × 8 inches), through which together were discharged 1730·6 cubic feet of air per man per hour.

(D) *Outlet.*—One chimney, having a throat the sectional area of which = ·4 square feet, discharged 685 cubic feet of air per man per hour; 685 + 1,730 = 2,415.

(E) *Outlets.*—Two foul air shafts, one (6″ × 6″) at each end of the room, through which the remaining 1,437 cubic feet of air per man per hour 3,852 − 2,145 = 1,437, were presumed to pass. They were covered by an immoveable grating at each end, so the anemometer could not be inserted to test them.

(F) One foul air shaft (6″ × 6″) in the middle of the ceiling, over the gas.

Supplementary Particulars.

(G) Two Sherringham valves (12″ × 3″), one on each side of the room Neither F nor G worked at all, at least no movement of air was detected.

5. The following particulars are necessary to supplement the tables opposite :—

Total corrected cubic space of room = 9,166 cubic feet.
" " per man = 828·72 "
" superficial space of room = 779 square feet.
" " per man = 70·81 "
Mean height of barometer of previous day, 30·207 inches.
" " this night, 30·380 "
" " following day, 30·307 "
Mean temperature of external air of previous day, 62·10° Fahr.
" " this night, 57·25° "
" " following day, 61° "
Wind, west; velocity, 5 miles per hour. A gentle breeze, pressure = 2 lbs. per square foot. Cloud = 1. Ozone = 4.

Microscopic Appearances.

6. In the six hours 26 cubic feet of air were drawn through an aspirator, and the suspended matters were collected in a condensing apparatus. Under a one-eighth inch object lens the following were observed :—

(A) Cotton fibres.
(B) Starch granules.
(C) Crystalline substances, sand or dust.
(D) Vegetable tissue of various sorts.
(E) Pollen.
(F) Amorphous molecules? Detritus of epithelium.
(G) Indefinite filaments like those figured by Professor Parkes in his Manual of Hygiéne, Ed. 3, p. 88.
(H) Minute moving particles like those marked "Z? Zoospores," Plate 1, pp. 52, 53, op. cit.

Differences between 1865 *and* 1869.

7. The following are the chief differences in the conditions observed on May 16 and 17, 1865, and July 9 and 10, 1869. For details see Tables annexed :—

	May, 1865.	July, 1869.	Difference.
(A) Mean difference between temperature of internal and external air..	20° Fahr.	7·5° Fahr.	12·5° Fahr.
(B) Mean height of barometer	30·35 in.	30·38 in.	0·03
(C) Number of men in room	16	11	5
(D) Superficial space per man = sq. ft..	48·68	70·81	22·13
(E) Cubic space per man = cub. ft. ..	573	828	255
(F) Cubic ft. of fresh air per man per hour	not stated	3852	?
(G) CO_2 per 1,000 volumes of internal air	1·301	·643	·658
(H) " " external "	not stated	·393	?
(I) Difference between internal and external air	not stated	·250	?

TABLE I.—Sanitary Report on Internal Air.

Date, 1863, Night of July 9—10.	Movement of Air in Feet per Man per Hour.				Carbonic Acid per 1,000 Volumes.	Temperature of Internal Air.	Temperature of External Air.	Difference in Temperature between Internal and External Air.
	At Outlet.			At Inlet.				
	By Chimney.	By Window.	By Both.	By Window.				
Hour.						° F.	° F.	
11	685	1,382	2,067	6,152	·690	67·50	56·50	11
12	685	2,131	2,816	4,167	·676	66	55	11
1	685	...	685	5,192	·458	65	54	11
2	685	1,015	1,700	1,349	·642	62	58	4
3	685	2,102	2,787	2,094	·730	66	62	4
4	685	2,764	3,449	4,158	·666	62	58	4
Total ...	4,110	10,384	12,904	23,112	3·862	388·50	343·50	45
Average...	685	1730·6	2150·6	3,852	·643	64·75	57·25	7·5

TABLE II.—Meteorological Report on Internal Air.

Date, 1869, Night of July 9—10.	Barometer.	Hygrometer.			Elastic Force of Vapour.	Vapour in 1 Cubic Foot of Air.	Vapour required to Saturate 1 Cubic Foot of Air.	Degree of Humidity.	Weight of 1 Cubic Foot of Air.	Difference in Temperature between Internal and External Air.	Date, 1869, Night of July 9—10.
		Dry Bulb.	Wet Bulb.	Dew Point.							
Hour.	Inches.	° F.	° F.	° F.	Inch.	Grains.	Grains.	Per Cent.	Grains.	° F.	Hour.
11	30·38	67·50	60·00	55·50	·441	2·05	4·85	70·50	533·27	11	11
12	30·38	66·00	60·00	51·10	·434	2·20	4·80	68·00	532·94	11	12
1	30·38	65·00	58·00	52·30	·391	2·50	4·30	63·00	534·13	11	1
2	30·38	62·00	57·50	53·65	·413	1·65	4·55	74·50	533·14	4	2
3	30·38	66·00	59·00	53·30	·406	2·50	4·50	64·00	533·12	4	3
4	30·38	62·00	57·00	52·70	·399	1·80	4·40	72·00	536·23	4	4
Total ...	182·28	388·50	351·50	318·55	2·484	12·70	27·40	432·00	3192·83	45	Total.
Average ...	30·38	64·75	58·58	53·07	·414	2·11	4·56	72·00	532·13	7·5	Average.

TABLE III.—Metereological Report on External Air.

11	30·38	56·50	53·00	49·75	·358	1·26	4·00	78·00	542·77	11	11
12	30·38	55·00	52·00	49·10	·349	1·00	3·90	81·00	545·80	11	12
1	30·38	54·00	51·00	48·10	·334	0·90	3·80	80·00	546·39	11	1
2	30·38	58·00	54·00	50·40	·367	1·30	4·10	76·00	531·17	4	2
3	30·38	62·00	55·00	49·00	·347	2·30	3·90	62·00	537·34	4	3
4	30·38	58·00	54·00	50·40	·367	1·30	4·10	76·00	541·15	4	4
Total ...	182·28	343·50	317·00	296·75	2·122	8·06	23·80	453·00	3244·62	45	Total.
Average ...	30·38	57·25	52·83	49·45	·353	1·34	3·96	75·50	540·77	7·5	Average.

(*Signed*) R. TEMPLE WRIGHT, 15*th July*, 1869.

APPENDIX No. IV.

MEMORANDUM RELATIVE TO THE OPERATION OF THE "CONTAGIOUS DISEASES ACT" OF 1866, PREPARED FOR THE INFORMATION OF THE SECRETARY OF STATE FOR WAR, AND LAID BEFORE THE SELECT COMMITTEE OF THE HOUSE OF COMMONS IN JULY 1869.

By T. GRAHAM BALFOUR, M.D., F.R.S., Deputy Inspector-General and Head of the Statistical Branch.

IN endeavouring to form from the numerical returns a correct estimate of the influence of the Contagious Diseases Act, there are several points which require to be carefully examined, to prevent erroneous conclusions being drawn from the mere numbers. 1. There may have been a general reduction in the amount of these diseases throughout the country, or affecting at least a number of stations. 2. There may have been a steady reduction going on at a station to which the Act has been applied, previously to its coming into operation, and the continued progress of that reduction may have been due to causes pre-existent to the Act. 3. There may have been a general increase in the prevalence of these diseases, when the beneficial influence of the Act might be confined to their non-extension, instead of being shown in their decrease. With a view to obtain information on these points, Table I. has been prepared, showing the admissions into hospital for venereal diseases of all kinds, per 1,000 of mean strength, at each of the principal stations occupied by troops in the United Kingdom during the nine years 1860-68. In the Tables, the stations to which the Contagious Diseases Act has been applied are placed first; and those years are underlined in which the Act was in operation.

I. An examination of Table I. shows a lower proportion of admissions into hospital for venereal diseases in 1868 than in 1860, at all the stations except the Isle of Wight, Colchester, Canterbury, London, Manchester, and Preston. At the last four of these the proportion of cases in 1860 was below the average, and the amount in 1868 was not materially in excess, and at some of them was less than in 1861-62-63. The Isle of Wight and Colchester, however, show a marked increase.

II. (*a*) At the stations to which the Act has been applied there was a progressive reduction in the amount of admissions from 1860 till 1863 at Shorncliffe, till 1864 at Devonport, till 1865 at Portsmouth, and (with the exception of a slight increase in 1863) at Chatham, till 1866 (except in 1864) at Aldershot, and till 1866 at Woolwich. At Devonport an increase took place in 1865, followed by a progressive decrease; at Portsmouth the increase extended over 1866 and 1867; at Chatham the increase was confined to 1866; at Shorncliffe there was a slight excess in 1863 and 1864, followed by a decrease in the three following years; at Woolwich there was an increase in 1866 and 1867; and at Aldershot in 1867. It may be stated generally, that prior to the introduction of the Act there had been at all these stations a progressive decrease in the amount of this class of diseases.

(*b*) At the stations to which the Act has not been applied, with two or three exceptions, a similar progressive reduction has been going on, but with less regularity, a result perhaps of the smaller numbers under observation giving rise to greater fluctuations. The marked exceptions were Canterbury and Colchester, at which a great increase took place in 1866, 1867, and 1868, and the Isle of Wight and Dover in 1867 and 1868. The troops in London and

Windsor and at Warley have not varied greatly if 1860 be omitted. A few of the stations show a marked increase or reduction for one year, returning in the next to nearly the previous amount; thus Warley in 1863 and Manchester in 1867 show a great increase, and Dover in 1865, and Pembroke Dock, Preston, and Limerick in 1866 a great decrease.

III. On examining the results for 1867 and 1868, during which the Act was in operation at four of the stations for the whole period, and at two others for a portion of it, it appears that there was a progressive decrease in the admissions at Devonport and Chatham, an increase in 1867, with a decrease in 1868 at Portsmouth, Woolwich, and Aldershot, and a slight decrease in 1867, with a considerable increase in 1868 at Shorncliffe. At the other stations there was a decrease only in the Household Cavalry, and an increase in 1867, followed by a decrease in 1868, at Edinburgh and Manchester; there was scarcely any change at Warley and Dublin; there was no appreciable change in 1867, with an increase in 1868, at Winchester and Canterbury. There was an increase in 1867, followed by a decrease in 1868, but the ratio still remaining higher than in 1866 at Fermoy and the Curragh; and there was an increase in both years at the other nine stations included in the return. It would thus appear that there has been a marked comparative advantage enjoyed in 1867 and 1868 by the stations at which the Act was in force, except Shorncliffe.

The preceding remarks apply only to venereal diseases generally, as shown in Table I. But under the general term of venereal diseases are included forms of disease which may have been contracted at various periods anterior to their coming under medical treatment, and the frequency of which is not likely to be directly influenced by the operation of the Act, such as secondary syphilis, many cases of bubo, &c. To get rid of this source of error, Table II. has been prepared, showing the ratio of admissions per 1,000 of mean strength from primary venereal sores and gonorrhœa, the two diseases most likely to be affected by the operation of the Act; they have been stated separately, as it is of great importance to ascertain whether any reduction effected in their prevalence extends alike to both, one of them being a disease liable to be followed by serious constitutional effects, whilst the other is usually only a matter of temporary inefficiency and inconvenience.

An examination of Table II., chiefly with reference to the last two years, the period during which the Act has been in operation, gives the following results:—

1. As regards venereal sores:—At the stations to which the Act has been applied there has been a decrease in the amount at all, except Shorncliffe, which shows an increase. At Portsmouth there was an increase in 1867, but followed by a decrease in 1868; and the ratio in the latter year was lower than in any of the four preceding years. At Shorncliffe the Act was in operation during half of the last year only, but the ratio of admissions was higher than in any of the three years immediately preceding. At the 18 stations included in the Table to which the Act has not been applied, there was an increase in the last two years at the Isle of Wight, Winchester, Preston, and Dublin; and the ratio in 1868 was higher than in any of the preceding years except 1864 at Winchester and Preston, and 1864 and 1865 at Dublin. There was an increase in 1867, followed by a decrease in 1868 at nine of these stations; but the decrease brought the ratio lower than in 1866, at only three of them, Canterbury, Edinburgh, and Belfast. There was a decrease in 1867, followed by an increase in 1868, at five stations; but at two of these the ratio in 1868 remained lower than in 1866.

As regards gonorrhœa, at the stations at which the Act was in operation; there was an increase at three, Portsmouth, Shorncliffe, and Aldershot; an increase in 1867, with a decrease in 1868, at Devonport and Woolwich; and a decrease in 1867, with an increase in 1868, at Chatham. Comparing 1868 with 1866, there was an increase of gonorrhœa at four, and a decrease at two stations. At the stations at which the Act was not in operation, there was an increase in 1868, compared with 1866, at 13, a decrease at three; and at two, the ratio was the same in both years. It appears, therefore, that there has been an increase at two-thirds of the stations in the first group, and at rather more than two-thirds in the second. But an examination of the Table shows that the actual amount of increase has been much less at the first than at the second

group of stations. In case of gonorrhœa, therefore, the operation of the Act would seem to have been in counteracting an increase rather than in effecting a decrease of the disease.

TABLE I.

TABLE showing the Admissions into Hospital per 1,000 of Mean Strength for Venereal Diseases at the following Stations for the Nine Years, 1860–68.

Stations.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	Date of Act coming into operation.
Devonport and Plymouth	440	470	367	351	289	360	317	312	280	10 Oct., 1866.
Portsmouth	503	485	407	349	337	329	359	378	348	8 Oct., 1866.
Chatham and Sheerness .	351	328	313	322	313	292	326	277	275	6 Nov., 1866.
Shorncliffe	327	325	233	248	249	233	219	215	297	24 July, 1868.
Woolwich	473	399	371	292	220	204	219	255	191	6 Nov., 1866.
Aldershot	339	361	349	303	321	302	233	261	237	12 April, 1867.
Isle of Wight	304	295	396	246	288	259	254	327	346	
Winchester	408	380	410	301	363	354	287	288	349	
Canterbury	290	397	441	435	310	239	379	375	407	
Dover	383	401	337	313	247	183	248	354	376	
London and Windsor } Household Cavalry	97	135	127	143	139	147	143	129	133	
London and Windsor } Foot Guards...	255	328	348	348	314	316	311	326	343	
Warley	...	335	290	412	294	313	328	328	330	
Colchester	430	415	464	396	371	355	451	500	537	
Pembroke Dock	228	261	217	187	224	184	100	153	159	
Manchester	289	487	455	330	314	332	312	501	312	
Preston	...	209	358	345	406	370	272	361	379	
Edinburgh	300	260	278	305	200	286	171	244	157	
Cork	346	354	288	294	253	249	160	196	209	
Fermoy	268	195	159	213	146	124	149	202	186	
Limerick	401	360	384	328	308	335	150	272	291	
Curragh	373	384	364	308	303	258	217	280	243	
Dublin	409	363	372	399	368	384	323	333	333	
Belfast	...	469	342	300	283	288	215	230	329	

TABLE II.

TABLE showing the Ratio of Admissions into Hospital, for Primary Venereal Sores and Gonorrhœa, per 1,000 of Mean Strength at each of the following Stations during the Five Years, 1864–68.

Stations.	Diseases.	1864.	1865.	1866.	1867.	1868.	Date of Act coming into operation.
Devonport and Plymouth ...	Venereal sore ...	110	133	82	76	66	10 Oct., 1866.
	Gonorrhœa ...	116	147	169	178	148	
Portsmouth	Venereal sore ...	121	113	100	116	86	8 Oct., 1866.
	Gonorrhœa ...	130	137	166	180	188	
Chatham and Sheerness ...	Venereal sore ...	88	86	83	71	63	6 Nov., 1866.
	Gonorrhœa ...	146	139	161	131	156	
Shorncliffe	Venereal sore ...	82	68	57	42	77	24 July, 1868.
	Gonorrhœa ...	91	96	111	125	123	
Woolwich	Venereal sore ...	80	76	89	88	46	6 Nov., 1866.
	Gonorrhœa ...	86	82	84	115	95	
Aldershot	Venereal sore ...	105	100	81	81	77	12 April, 1867.
	Gonorrhœa ...	121	112	88	99	100	
Isle of Wight	Venereal sore ...	74	32	11	59	103	
	Gonorrhœa ...	145	164	198	165	148	
Winchester	Venereal sore ...	111	72	46	52	104	
	Gonorrhœa ...	181	206	147	129	172	
Canterbury	Venereal sore ...	68	77	117	119	114	
	Gonorrhœa ...	173	100	131	176	210	
Dover	Venereal sore ...	90	67	90	132	111	
	Gonorrhœa ...	93	73	104	136	181	
London and Windsor ... Household Cavalry ...	Venereal sore ...	48	50	58	45	50	
	Gonorrhœa ...	46	42	42	47	42	
London and Windsor ... Foot Guards	Venereal sore ...	192	162	178	171	173	
	Gonorrhœa ...	85	80	67	78	81	
Warley	Venereal sore ...	52	97	79	74	92	
	Gonorrhœa ...	167	192	207	218	181	
Colchester	Venereal sore ...	118	107	173	145	182	
	Gonorrhœa ...	177	168	188	226	214	
Pembroke Dock	Venereal sore ...	65	83	31	28	35	
	Gonorrhœa ...	104	57	52	96	81	
Manchester	Venereal sore ...	104	127	92	177	115	
	Gonorrhœa ...	94	151	148	239	113	
Preston	Venereal sore ...	99	85	75	87	87	
	Gonorrhœa ...	229	207	129	180	182	
Edinburgh	Venereal sore ...	66	112	58	63	46	
	Gonorrhœa ...	97	132	81	129	91	
Cork	Venereal sore ...	76	86	49	72	61	
	Gonorrhœa ...	104	88	63	76	81	
Fermoy	Venereal sore ...	34	44	36	70	47	
	Gonorrhœa ...	71	45	63	94	100	
Limerick	Venereal sore ...	129	71	48	117	114	
	Gonorrhœa ...	91	176	55	106	114	
Curragh	Venereal sore ...	129	97	77	104	85	
	Gonorrhœa ...	93	86	77	104	96	
Dublin	Venereal sore ...	179	150	126	129	139	
	Gonorrhœa ...	107	142	114	122	118	
Belfast	Venereal sore ...	109	46	74	89	56	
	Gonorrhœa ...	96	174	86	70	237	

APPENDIX No. V.

A FEW REMARKS ON SOME OF THE PRUSSIAN ARRANGEMENTS FOR THE TRANSPORT OF WOUNDED IN TIME OF WAR.

Extracted from a Report on the International Conferences of the Societies for aid to sick and wounded soldiers in time of War, which took place at Berlin in April, 1869.

By Deputy-Inspector-General T. LONGMORE, C.B., Professor of Military Surgery, Netley.

THE chief objects of professional interest that I visited at Berlin were the Royal Charity Hospital, Barrack Hospital wards, arrangements for Transport of Wounded by Railway Ambulance Trains, exercises of the Kranken-träger, Garrison Hospital, Central Gymnasium, the new Dissecting Theatre of the University, and the Invaliden-haus.

Two only of these have appeared to me to afford matter worth remarking upon in this report, viz., the railway arrangements for transport of wounded, and the exercises of the Kranken-träger, or bearers of wounded. On these, therefore, I proceed to make a few observations.

Excursion to show the Prussian arrangements for the Transport of Wounded Soldiers by Railway in time of War.

This excursion took place on the Stettin Railway. The train, which consisted of several passenger carriages and a covered goods-wagon, proceeded as far as the station of Landau, and, after a stay there of short duration, returned to Berlin. Among the passenger carriages were two of the fourth-class carriages, with end doors and platforms, prepared for the reception of stretchers, after the manner described at pages 458 to 461 of my treatise on the Transport of Sick and Wounded. The goods-wagon was fitted with rings for the reception of swinging horse poles and litters, in the fashion explained in the same treatise, at page 462. There were also some springs of a new description for supporting stretchers on the floor of the goods-wagon.

A party of men of the Fusilier Guards were marched to the station, carrying about 20 Prussian field stretchers. The stretchers being laid along the station platform, some of the visitors laid themselves down upon them, and were successively carried up the steps to the railway carriage platforms, and, after turning, were carried through the doors into the carriages themselves. As each stretcher, with the person lying upon it, was brought into a carriage it was suspended from the hooks by elastic rings provided for the purpose.

The bearers passed out at the opposite end of the carriage, and thus left room for fresh bearers and stretchers to enter, until the carriage was full. This proceeding was accomplished without any material difficulty or hazard to the supposed patients upon the stretchers.

The floor of the goods-wagon being on a level with the platform of the station, and the sliding doors very wide, there was no difficulty whatever in carrying stretchers into it.

I travelled to Landau on the stretchers in the goods-wagon, and returned to Berlin on a stretcher in the fourth-class passenger carriage.

In going to Landau, I found the jolts sufficiently broken while I was lying on one of the litters perched upon the swinging poles, but the swinging motion itself, or lateral oscillation, was greater than was desirable.* When lying upon one of the stretchers placed upon the springs fastened to the floor, the swinging movement was avoided, but there was more jolting than was desirable; still, by each plan, whether by stretchers placed upon the poles suspended across the truck, or by stretchers put upon springs inserted into the floor, the condition of the patient would be far preferable to that of one lying upon a

* Since this report was written, the swinging-pole litters have been abandoned, and the floor-spring stretchers described in the report have been, with some modifications, adopted for use in the Prussian Service.

stretcher without such intervening means of lessening jolts during the transit, or of another patient placed upon straw, or any other similarly soft material laid directly on the floor of the wagon itself.

The springs inserted into the floor were semi-elliptical steel springs. The under surface of the foot at one end of the spring was furnished with three or four small projecting spikes. A slight stamp drove these spikes into the floor of the truck, and accordingly fixed at a required spot the end of the spring under description. The foot at the other end of the spring was fitted with a small iron wheel or roller. A weight pressing upon the spring would thus cause the end to which the roller was attached to move onwards; and in like manner, a jolt from below, acting on the floor of the truck, would be partly expended by the motion given to the spring before reaching anything lying upon the spring above. The stretchers were not placed directly on the springs; but four of these springs being fixed at certain intervals on the floor of the truck, two poles were laid crosswise as to the wagon, into crutches on the top of the springs; then upon these poles three stretchers were laid, in the direction of the length of the wagon, and therefore in the direction of the movement of the train. A goods' van would thus admit three stretchers on the floor and three suspended above on each side of the doorway, or 12 stretchers in all. It would evidently, however, never answer to put such a number of patients into one of these vans, if it could possibly be avoided, owing to the want of the necessary ventilation and light. During the journey to and from Landau, the sliding entrance-doors had to be kept apart to a certain extent in order to obtain light and air, there being no windows or special means of ventilation provided in such conveyances.

On comparing the two systems of transport there could be no doubt as to the superiority in every respect of the one in which field-stretchers were suspended in the fourth-class carriages. The desired ease of position of movement as regards the patient appeared to be as fully attained as practicable; no risk or disturbance would be caused to him in taking him in or out of the carriage, provided the bearers were trained to the work, and properly directed. There was every facility of affording attention to a patient's wants during the transit; the carriages were well lighted, and thoroughly aërated; and the system economical, both as regards the material employed and the capabilities of administration.

The only want noticeable, had there been really a train of sick and wounded proceeding for a journey of some duration, would have been the addition of a carriage offering the means of treating and cooking some slight articles of support and refreshment, with a few hospital conveniences, such as the nature of the cases would be likely to render necessary during the transit. An important feature was, that, however many carriages might be added to the train, there would still be a free passage from one to another throughout its whole length. The facility of communication was due to the end doors and connecting platforms.

Exercises of a Company of Bearers of Wounded (Krankenträger-Compagnie).

These exercises took place in the large artillery drill ground at the back of the barracks of the Fusilier Guards. The men who were inspected were taken from the ranks of two regiments of the Guards—Foot Guards and Rifle Guards. They had all been taught and drilled to act as sick-bearers. Surgeon-Major (Ober-Stabs-Arzt) Dr. Roth, of the Sanitary Corps, and Assistant-Surgeons Dr. Fenerstack and Dr. Goering conducted the technical part of the inspection, the whole being under the command of Major Von Schmerling, of the Fusilier Guards. Lieut.-General Graf von Bismarck-Bohlen, Commandant of Berlin, and a large number of officers and visitors were present at the inspection.

The body of men assembled for the purpose of going through their exercises in the transportation of wounded consisted of 9 serjeants, 13 hospital assistants or orderlies, and 156 men from the ranks, trained as bearers. Of this number each of the four battalions of Foot Guards had furnished 2 serjeants, 3 hospital orderlies, and 36 men as bearers, and the battalion of Rifle Guards, 1 serjeant, 1 hospital orderly, and 12 men as bearers. There were also

a number of men on the ground intended to represent wounded men requiring carriage. The Train Battalion of Foot Guards had supplied 4 ambulance wagons for severely wounded, 1 sanitary detachment wagon, and 1 hospital equipment cart.

On the inspection commencing, the body of sick bearers were divided into two sections; one section was arranged to represent part of a field sanitary detachment, the other to act simply as bearers. To the coat of each of the men who represented the wounded was attached a small label, and on this label was written the description of wound he was supposed to have received. These men then distributed themselves in a lying position along a supposed line of battle at one end of the drill-ground. At the same time, the ambulance wagons drew up at a distance in rear, with the sanitary detachment wagon and hospital equipment cart.

On the order being given, the equipment cart was unpacked, a tent for surgical operations rapidly erected, its nature being designated by a flag, and also by a lantern for use at night; while a number of the men, representing the sanitary detachment, ran with stretchers, splints, bandages, &c., to the place where the wounded were lying. Each supposed wounded man then received the primary dressing called for by the nature of his injury marked on the label, and being placed on the stretcher, was brought to the first line of surgical assistance, where the hospital tent had been pitched and the ambulance wagons drawn up. Here the injury was examined by one of the Assistant Surgeons, and if nothing further was supposed to be required in the bandaging or dressing of the wound, the patient was placed recumbent or sitting, according to the kind of injury, in one of the wagons, ready for removal further to the rear. Two kinds of stretchers were used—ordinary field stretchers and wheeled stretchers. It was understood, with regard to these latter conveyances, that the wounded lying on them could have been conveyed without change to a more remote distance than that to which the first line of surgical aid had been fixed.

As soon as the first section of bearers had gone through these exercises, all the stretchers having been employed, the second section of bearers advanced without stretchers. These bearers then picked up a number of the men representing the wounded and brought them to the first line of surgical aid. They carried them in various ways, according to the site of the wounds marked on their respective labels, sometimes simply by means of their hands, sometimes with the additional aid of belts, or by making use of the rifles, knapsacks, blankets, &c., of the wounded men.

All the supposed wounded having thus been brought in, the inspection terminated.

The whole review was conducted in a very systematic manner, and examination of the various modes in which splints, bandages, tourniquets, &c., had been applied for the particular wounds mentioned on the labels, as well as observation of the various special modes of carriage, both showed that the bearers were thoroughly trained in their duties, and that they fully appreciated the necessities which they had had to meet. It was sufficiently evident that the practical application of the exercises on a battle-field would contribute towards saving many lives that would otherwise be lost; but especially would be the means of preventing aggravation of fractures and other injuries that would unavoidably happen, under like circumstances, to such an extent as to render all attempts at conservative surgical practice unavailing if no system of the kind were followed, nor corresponding aid available. I do not attempt to give any account of the plan of instruction by which the bearers in the Prussian army are prepared and trained in the exercises which were gone through on the occasion of the inspection just described, as I have given them in sufficient detail in my treatise on the transport of sick and wounded (page 50, &c.), and the information I obtained on the subject on this occasion, in Berlin, agreed in all important particulars, with what I have there written.

In considering the inspection of the Prussian Kranken-träger, the reflection naturally occurs that no corresponding plan for the transport of sick and wounded yet exists in the English army. It has been the custom in the English army for the bandsmen of regiments to help in the removal of wounded after an action, and though there is no reference in the Queen's

regulations and orders for the army to this being part of the duties of bandsmen, they are still generally supposed to be available for this occupation. Their ordinary duties, however, in no way prepare them for such an occupation, and they do not receive any training to enable them to understand the special needs of wounded men; they are not taught the particular modes of sick carriage, and it is essential that these should not only be verbally imparted, but also be systematically practised, if serious addition to existing injuries is to be averted, and unnecessary suffering avoided. Neither do any military regulations exist to ensure the systematic execution of sick-transport duties in the field by bandsmen, even if they were competent for their performance.

The only men who have hitherto been trained for sick-transport duties in the field have been a certain number of the men of the Medical Branch of the Army Hospital Corps. The strength of this body is 440, and about one-fourth of this number have gone through a course of training in transport duties. It is most important that these hospital attendants should be well acquainted with the proper methods of caring for and transporting sick and wounded; but in time of war the men of the Army Hospital Corps will doubtless be chiefly occupied in the fixed hospitals, where their assistance will be most urgently required in their ordinary capacity of hospital attendants, and not in the ambulances, and they will, therefore, not be available for the carriage of wounded after action with an enemy.

There appear to be only two plans by which the performance of transport duties in the field can be properly accomplished, presuming the Army Hospital Corps to remain of such a strength as to be only adequate to meet the wants of the fixed hospitals, and economical considerations will probably prevent the corps from ever exceeding such a number. One plan is to prepare the regimental bandsmen systematically for the duties which are nominally entrusted to them of a Sick and Wounded Bearer Corps; the other, to train a selected few from the ranks of regiments for these duties, on the German system. In each of these two cases, the bearers will be employed in their military duties in time of peace, excepting only at the periods when they have to go through their exercises as bearers; in time of war, they will only be occupied as bearers on particular occasions occurring to require their services. If the Army Hospital Corps were to be increased sufficiently in number to meet the want under consideration, the corps would be in excess of what was required for attendance in the hospitals, and the services of part of the men would not, under ordinary circumstances, be turned to account.

Should the first plan, that of trained bandsmen, be adopted, there might be available a bearer corps of 1 serjeant, 1 corporal, and 19 privates for each Infantry regiment, and 1 serjeant and 15 privates for each Cavalry regiment.

To render such corps efficient in their duties, it would be essentially necessary that each should go through one complete course of instruction in field-transport duties under an experienced instructor, such as the men of the Army Hospital Corps go through at Netley. The course should comprehend a knowledge of the first assistance to be given to wounded, stoppage of bleeding, application of splints to fractured limbs, the first temporary dressings of wounds, the proper carriage of sick and wounded on stretchers, modes of removing wounded when no stretchers are available, transport of wounded on mule litters, cacolets, in ambulance wagons, &c. The first course of instruction would occupy nearly a month. A repetition of the exercises should take place annually in a similarly systematic way, a code of directions being furnished for the purpose, under the Medical Officers of the regiments to which the men might belong. If properly directed and thoroughly carried out, ten days would probably suffice for their annual practices, so as to keep the trained men expert in their work.

In working this plan in the field, it might be conducted strictly on the regimental principle, the bandsmen acting as a bearer corps, being available for duty with their own regiments only, and acting under the guidance of their own regimental Medical Officers, or they might be brigaded together with the bandsmen bearers of other regiments. In the former case, the bandsmen for the time being would form part of the regimental Field Hospital Establishment, which, in an Infantry regiment, might then be enumerated as follows:—

1 Surgeon, 2 Assistant-Surgeons, 1 hospital serjeant, 2 hospital orderlies, 1 serjeant of Bearer Corps, 1 corporal of ditto, 19 privates, together with 1 non-commissioned officer and 4 privates of the Military Train. If brigaded together, the Bearer Corps being tripled in number, it would be necessary to have a combatant officer told off for purposes of command; the general direction of the duties, so far as the employment of the men in gathering and removing the wounded might be concerned, being vested in the Principal Medical Officer with the brigade.* If this system were authorised, and no obstruction to its detail permitted, the removal of the wounded in case of an action ought to be accomplished without delay and without confusion, and there would rest sufficient responsibility for the due execution of this important service.

The chief difficulty I anticipate in carrying out such a plan, and probably a fatal one to its accomplishment, is the peculiar constitution of regimental bands, and the relations of bandsmen to officers of regiments. Regimental bands being to a large extent maintained at the cost of regimental officers, I hardly think it likely that these officers will approve of their bandsmen being sent away, even for one month, to go through a course of instruction in such duties as those of bearers of sick and wounded.

At the same time, I feel assured that unless the instruction be given systematically by an instructor who has made himself thoroughly conversant with the subjects to be taught, not only theoretically but practically, by whatever other plan the information may be attempted to be imparted, the supposed training and preparation will still be little better than nominal, and the required ability essential for the proper care and transport of wounded men will not be forthcoming in the hour of need.

The plan of training bandsmen to act as bearers of wounded failing, the plan of training men from the ranks remains. This is the plan adopted in Prussia, and no better organization for exercising and training men from the ranks can perhaps be formed than that on which the Prussian system is at present conducted. In applying it to the British Service, the limited numbers of the English Army, as compared with the Prussian Army, and the differences springing from a system of conscription, as compared with one of voluntary enlistment, first force themselves upon the notice. It is questionable, however, whether these considerations touch the real want under consideration. It is rather a matter of relative proportion than one of general number. If the necessity for trained bearers of wounded be once estimated, in the English Army, at the same value as it is in some continental armies, then whatever may be the numerical strength of an army, the number of trained men for taking care of its wounded on a field of action must be a proportionate want, otherwise it must be admitted that all the troops being wholly required for fighting, the same amount of attention cannot be given to those who fall wounded as in the armies where trained bearers are provided.

Identification of Dead and Badly Wounded Soldiers on Fields of Battle.

Among the votes adopted by the International Conference at Berlin was one stating the necessity for suitable means being found to permit of the identity of dead and wounded soldiers being established. This resolution is numbered 14 among those regarding "Continental War."*

Since the conclusion of the Conference, Professor Gurlt, of the King's University, Berlin, has written to me on the subject, and in his letter has forwarded some samples of identifiers proposed by him. He had personally prepared the samples forwarded, and he has requested me to bring these contrivances to the notice of the War Office authorities in England. The specimens, two in number, which I will describe presently, have been deposited in the Museum of Military Surgery at Netley for safe keeping and observation.

The subject of identification of dead on fields of battle was discussed at the International Congress of Delegates from the Aid Societies held at Paris in the year 1867. The delegates on that occasion endeavoured to get an addi-

* It has not been thought necessary to print the votes and resolutions here referred to.

tional article made to the Convention of Geneva, binding all the contracting Powers to that convention to take care in time of war that every soldier was furnished with an uniform compulsory token appropriate for establishing this identity. In my second Report on the Conferences at Paris I made the following remarks on this proposal :—

"This last subject (identification of dead on fields of battle) was brought to "the notice of the assembled delegates through a letter from the Austrian "Ministry of War. In this communication it was stated that, up to the date "on which the letter was written (shortly before the assembling of the Con- "gress), no certain information had been received respecting the fate of the "majority of the missing soldiers of the Austrian army engaged in the cam- "paign in Bohemia of the previous year; so that their relations had "remained for a long time in doubt whether they were dead, wounded, or "only prisoners; and were still uninformed as to the circumstances and place "of their decease, whether it had occurred on the field of battle or subse- "quently while under treatment for wounds in hospital.

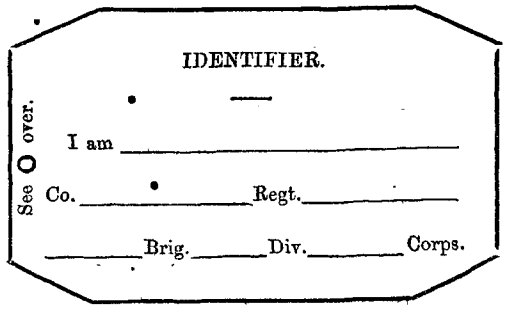
"It was argued, although in all civilised armies their exists some method "by which each soldier can be personally identified, and by which his corps "and company can be determined by any one of the army to which "he belongs, that something more is required in time of war, viz., a method "by which the same facts can be ascertained, without delay or risk of error, "by other armies. On this view, a general mode of indication, for purposes of "identification common to all armies, appeared to be required; while, to guard "against risk of errors in copying, and also to save time, it seemed to be con- "sidered that the indication should be on something that could be detached when "necessary from the person or clothing of the soldier, such as a tablet sus- "pended to his neck, or a small parchment label stitched within his tunic. A "small belt, containing the materials necessary for the first dressing of wounds, "and intended to be worn buckled round the waist, within the tunic and "trowsers as part of the field kit, was exhibited as one plan by which the "object in view could be obtained. In a small pocket of this belt there was a "parchment label, bearing the name, regimental number, and other particulars "required for the identification of the wearer. Should either of these methods "or any similar plan be adopted, all that would have to be done as regards the "dead on the field of battle would be for the officer or non-commissioned "officer of each burial party to have the indicators removed and collected "before the burial of the bodies, and to remit them to the authorities for "registration and communication to those concerned. Such a proceeding, if "systematically enforced, would certainly prevent the evils and sufferings "described in the letter above referred to from the Austrian Ministry of War."

The samples of proposed identifiers forwarded by Professor Gurlt are an imitation of some marks partly designed for similar purposes and distributed by a society called the "Christian Commission of the United States," during the late civil war in North America, but they differ in the materials employed and in certain other particulars in which the American identifiers have been said to have been found defective. It is this technical part of the subject that Professor Gurlt has particularly studied, with a view to making the identifiers as simple and useful as possible, at the same time avoiding all source of risk of inconvenience from their employment. He has tried to embody the results of his enquiries into the matter in the improved samples he has forwarded for observation.

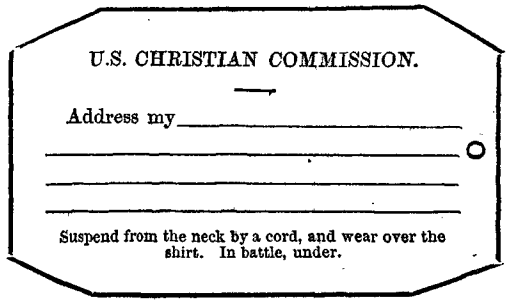
Three different modes for identifying soldiers, whether dead or insensible from wounds, have been proposed, viz. :—

1st. The identifiers of the United States' Christian Commission, of which the following illustrations are taken from a specimen of the identifier under notice, deposited by me in the Museum of Military Surgery at Netley :

Front.



Reverse side.



This identifier is rectangular, and in the original has rounded corners. It is made of vegetable parchment. At one end of it there is a metal eyelet-hole, to permit its suspension, by means of a cord or piece of tape, from the neck of the wearer.

2nd. A small metal label for identification has been proposed, and, according to Dr. Löffler, Inspector-General of the Medical Staff of the Prussian Army, is likely to be introduced into the military service of the North German Confederation.*

This label is of tinned iron, with smooth edges; is arranged for being worn close to the body, suspended by a cord from the neck; and has stamped upon it only two indications, viz., the number of the soldier bearing it, and his regiment. One of these identifiers is to be issued to every soldier on the order of mobilisation being carried into effect.

3rd. A third kind of identifier has been proposed by Serjeant-Major Wernek, of the Bavarian Army. It consists of a small quadrangular tin case with rounded corners, composed of two separable portions hinged, capable of being folded together, and containing a few leaves of writing-paper or parchment. These pages are intended to have written upon them by ink or lead pencil, the name, number of the bearer, and his regiment, and, eventually, in case of death, or of the wearer being wounded, some brief notes by the examining Surgeon. This identifying tablet or medallion is to be worn on the chest by means of a string of twine or catgut, in the same way that Russian soldiers carry their baptismal amulets. The soldier is always to wear this medallion, even in hospital. It is only to be taken off on burial, when it is to receive an authorised signature, and to be returned to head-quarters.

Professor Gurlt, after considering these three kinds of identifiers, has concluded that an identifier on the American plan is the only one worth adopting. He objects to the two others because, being made of metal, if struck by a bullet they add, in his opinion, to the risk to the patient,—either by distributing the effects of the stroke over a wider space, or, if carried with the bullet

* F. Löffler, &c., &c., Das Preussische Militär-Sanitätswesen und seine Reform nach der Kriegeserfahrung von 1866, 1869, S. 234.

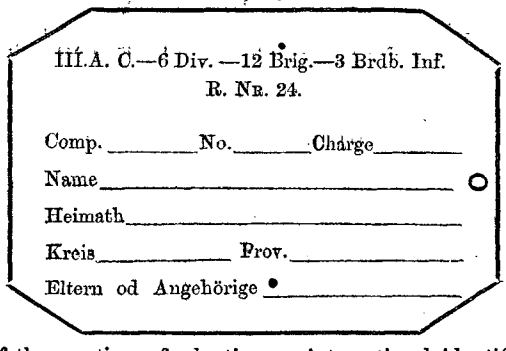
into the wound, by seriously complicating the injury. On the other hand, a soft material permits no more to be carried into the wound than the man's tunic or shirt does. He also objects to the simple record in the proposed North German metal identifier,—the number of the regiment and matriculation number of the soldier,—as being insufficient to afford the required information in case of various accidental occurrences; whilst the ordinary ink or pencil on the leaves of the proposed Wernek tablet, he considers liable to obliteration from the effects of perspiration, rain in marching, water in bathing or swimming entering among the writing. Dr. Gurlt also prefers linen or sick tape to catgut for suspending the identifiers, as the catgut is liable to become objectionable under the effects of perspiration.

The two specimens of identifiers sent to me by Dr. Gurlt differ from each other only in the substance of which they are severally composed; the form, the mode of inscribing upon them, and the inscriptions, are alike in both. One identifier is made of a flexible brown-coloured oilcloth; the other of parchment wholly enclosed in a varnished tracing-paper cover, which is pasted at the back of the tablet, and allows the writing to be read through its substance. Each identifier thus arranged offers complete resistance to permeation by fluids. In shape, size, and also as regards the metal eyelet hole, the two identifiers resemble the American one. The inscriptions upon them are, however, written with special ink, viz., printing ink diluted with boiled oil to such a consistence as to admit of being used with an ordinary quill pen.

Words written with ink thus prepared are stated to dry in 12 hours. The written inscription on one face of the identifier includes the army division, regiment, regimental number and company of the bearer, his name, birthplace, and address of nearest relations.

The reverse side of the identifier is left blank for the insertion of a last will, or the signature of the burial serjeant.

The following sketch shows the arrangements of one of Professor Gurlt's proposed identifiers :—



In case of the question of adopting an international identifier of the dead and severely wounded on fields of battle being considered, I have thought it well to mention what has hitherto been done with reference to the subject. The American and Professor Gurlt's identifiers being deposited in the Museum of Military Surgery are available for observation.

I am not inclined myself to attribute so much importance to the additional risk resulting from wearing a small metal tablet over the chest as Professor Gurlt does. No doubt the gravity of a penetrating wound would, to a certain extent, be increased if the metal tablet happened to be struck by a bullet, and the chest penetrated, but such an accident must be very exceptional, and the proportion in which the final result of such a wound would be affected by complications resulting from this course, must be, under any circumstances, small in the extreme. On the other hand, if struck with a certain degree of obliquity, the metal tablet might even prevent penetration of the chest by a bullet. On the whole, however, the oilcloth identifiers of Professor Gurlt appear to offer a more generally practicable and serviceable plan of identification than by means of a simple metal plate, and to be free from the objections above mentioned that are certainly incident to the plan of writing with common ink or pencil.

APPENDIX, No. VI.

REMARKS ON ANEURISM AND DISEASES OF THE HEART AT ALDERSHOT.

By Inspector-General LAWSON.

THE admissions and deaths at Aldershot from the various affections comprised in this class, during 1868, are given in the following Table, with the usual millesimal ratios for 1867 and 1868. All the deaths from those which occurred suddenly, out of hospital, have been included (but not in the admissions) to show the total amount of disease among the troops during the year.

Diseases.	1868.		Millesimal Ratios.			
			1867.		1868.	
	Admissions.	Deaths.	Admitted.	Died.	Admitted.	Died.
Pericarditis	2	1	·4	·12	·2	·10
Degeneratio cordis	2	..	..	..	·2	..
Hypertrophia „	9	..	4·1	·12	·9	..
Morb. valv: „	37	5	1·7	·23	3·6	·49
Palpitatio	17	..	·4	..	1·7	..
Angina pectoris	..	..	·2	..	..	..
Syncope	1	2	·1	..	·1	·20
Aneurisma aortæ	16	15	·3	·81	1·6	1·48
„ art. pulmonalis	..	1	..	..	·1	·10
„ carotid inter...	1	1	..	..	·1	·10
„ popliteal is	2	..	..	..	·2	..
Phlebitis..	1	..	..	..	·1	..
Varix	7	..	1·3	..	·7	..
Total	95	25	8·5	1·28	9·4	2·47

This table presents a sudden and remarkable increase of the mortality from diseases of the heart, though their numbers have remained much the same, viz., 6·9 in 1867 against 6·8 in 1868 (including in the latter men who died out of hospital). In aneurism there has been both a large increase in the admissions, and a mortality twice as great as in 1867.

The millesimal ratio of deaths from diseases of the heart and aneurism since 1860, at this station, were as under:—

	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.
Diseases of heart.	·19	·69	·56	·49	·62	·60	·50	·47	·79
Aneurism ..	·25	·38	·24	·25	·43	·43	·40	·81	1·68

Thus, with the exception of 1860, the deaths from affections of the heart have not varied very materially, while aneurism was not greatly different up to 1867, when it became doubled, and the high ratio of 1867 was again doubled in 1868.

The first thing that appears on enquiry is that both forms of disease are nearly equally distributed among the mounted corps and the Infantry. Thus, during 1868, there were, including Engineers, Artillery, and Military Train, nine mounted corps in camp for various periods amounting, in the aggregate, to 349 weeks. As the strength of these were not materially different, they may be considered as represented by 6·7 mounted corps for one year. Among these there were three deaths from affections of the heart, and six from aneurism. There were in all 20 Infantry corps in camp for various periods in 1868, giving an aggregate of 528 weeks, equal to 10·2 regiments for one year, among which there were five deaths from affections of the heart, and 11 from aneurism; thus the causes of these diseases operated with much the same force in both classes. In no corps was there more than one death from an affection of the heart, but aneurism was much more unequally distributed, as will appear from the following statement:—

MOUNTED CORPS.

Regiments.	Deaths from Aneurism.	Weeks at Aldershot in 1868.
1st Dragoon Guards	1	33
Royal Horse Artillery	1	53
Royal Artillery	2	53
Royal Engineers	1	53
Military Train	1	53
	6	245
	= 4·7 Corps for 1 year.	

INFANTRY CORPS.

Regiments.	Deaths from Aneurism.	Weeks at Aldershot in 1868.
20th Foot, 1st Battalion ..	1	32
54th „	2	38
80th „	2	36
97th „	2	31
98th „	4	51
	11	188
	= 3·6 Corps for 1 year.	

One of the deaths in the Artillery occurred on the march from Woolwich to Aldershot, but as it was accounted for in the next weekly return from this, it was included with those on the station. The extraordinary fact comes out that though there were an average of 10·2 Infantry regiments at the station for a year, the deaths from aneurism appeared in five of them only, whic were together 188 weeks under observation, equal to an annual average of 3·6 corps, scarcely more than the third of the force; and a third of the whole

number were met with in one of these regiments, the 98th. Of the four fatal cases in the latter corps one proved to be of the rare form of aneurism of the pulmonary artery, and another, of the aorta, had been known to be in existence for a considerable period, but as the patient was a well conducted man, of considerable service, he was placed at light duty and kept on togive him the advantage of a pension.

It thus ap pears that aneurism was not connected with any particular arm of the Service, and, even in the Infantry, was very irregularly distributed. What may have been the cause of the latter peculiarity is difficult to say. Of the five regiments in which it occurred the 1st Battalion 20th, 97th, and 98th Regiments had arrived from Bengal little more than a year previous to their coming to Aldershot, while the 80th came home from the same station a year earlier, and the 54th was at home in 1865. On the other hand, the 34th and 51st, which arrived from Bengal about the same time as the three regiments first named, had no trace of this disease, as well as the other corps recently come home from Malta, Bermuda, Cape, New Zealand, or which had been longer in this country.

As to age, the following were the number of deaths at each year from affections of heart and aneurism :—

Ages.	Diseases of Heart.	Aneurism.	Ages	Diseases of Heart.	Aneurism.
25	1	..	33	..	1
26	1	..	34	..	..
27	2	2	35	1	..
28	1	4	36	..	..
29	..	2	37	..	1
30	1	2	38	..	2
31	..	1	41	1	..
32	..	2			

Of the deaths from cardiac affections, that from pericarditis presented nothing requiring comment. Of the five cases returned as valvular disease, there was incompetency of the tricuspid valves in one, which proved fatal from regurgitation and dropsy in the usual manner; in three there was some incompetency of the mitral valves and disease and patency of the aortic; in one of these there was one aneurism of the aorta as well; and in the fifth no details are available. There were two cases returned as dying from syncope. One of these, Private R. Millan, Army Hospital Corps, aged 25, came under treatment on 28th October, 1868, having pricked his finger some days before, while washing the floor of his ward in the North Camp. This caused a painful swelling of the glands in the axilla, and was accompanied by febrile symptoms, with pains in the joints, and on 30th October an erysipelatous affection of the integuments over anterior part of right leg. He was very restless and uneasy during the night of 31st October, and early on morning of 1st November he died rather suddenly. On examining the body a large white coagulum was found in the right side of the heart, extending continuously from the auricle through the ventricle into the pulmonary artery, and nearly filling up the latter. The state of the endocardium was not specially noticed.

The other case reported as proving fatal from syncope was different in its nature, and the cause of death was not obvious. The subject, Sergeant-Major Barnes, Royal Engineer Train, aged 35, a muscular, healthy looking man, was attending the divisional races on 22nd April, and was much interested in the performances of a horse on which he had betted; he ran towards the winning post to see it come in; after proceeding about 50 yards he stopped to speak tosome one, and while doing so he fell down, and after a few gasps expired. On examining the body, 24 hours after, the superficial veins were found congested. The heart was healthy in appearance, the right cavities full of fluid blood, the left empty. The edge of one of the mitral valves was thickened.

The aorta, both thoracic and abdominal, and its valves, healthy. There were old pleuritic adhesions on both sides. The lungs were much congested throughout, but were crepitant, and otherwise healthy. No trace of disease was found in the cerebrum or cerebellum, save a slight fulness of the vessels, and a slightly reddish tinge of the grey matter, but without perceptible softening. The liver, spleen, and kidneys were healthy, but congested. Congestion of the lungs appears to have been the immediate cause of death in this case, but from what cause arising it is difficult to say. The affection of mitral valves seemed insufficient to account for it, even with the excitement the man was under at the time, and no cerebral affection was discovered sufficient to account for the rapidly fatal termination.

In the remarks on the causes of aneurism among the troops in South Africa in the Sanitary Report for the Army for 1866, I stated (p. 554), that phlegmonous inflammation of a limited portion of the coats of the large arteries and veins was by no means rare on that station, and whether by the formation of abscess, as in some instances, or merely by infiltration and softening of the tissues, as seemed to have been the case in others, their elasticity was so reduced that they were unable to withstand the pressure of their contents, and rupture took place, causing death when the surrounding parts did not offer resistance to the escape of a sufficient quantity of blood, and simulating aneurism when this impediment existed. These positions were established by a series of cases in which death had occurred while the vessels were in the conditions mentioned, but it was inferred, from our experience of similar affections in other parts of the system, that such local inflammations might become resolved, leaving, however, a greater or less alteration of texture, and diminution of power of resistance to expansive strain, so that under favourable circumstances a gradual stretching might take place, and an aneurismal sac be formed.

Rokitansky was of opinion that the first step in the production of aneurism was the disease of the inner coat of arteries commonly designated atheroma in this country, though continental pathologists seem to confine that designation to this affection in a subsequent stage, when its deeper layers have undergone fatty degeneration, and the whole begins to break up. This, he says, gives rise to consecutive disease of the circular fibrous coat and cellular sheath (the term circular fibrous coat indicates the middle and cellular sheath the outer coat of the artery), and dilatation begins, sometimes embracing the whole circumference of the vessel, constituting the true aneurism, or proceeding from a limited portion of its walls, and expanding into a pouch of variable size, constituting the saccular form. A secondary dilatation sometimes proceeds from a true aneurism, which assumes the saccular character. (Pathological Anatomy (Sydenham Society edition), Vol. IV., p. 276-8).

With reference to saccular aneurism, he makes the following distinctions :—

"1. In most cases, the wall of the sac at its base near the opening into "the artery, consists of the wall of the artery that has been everted by the "aneurism, and of all the diseased coats of the artery, whilst the circular "margin surrounding the opening is formed by a duplication, as it were, of "the entire wall of the vessel."—"The margins of the opening are smooth and "covered by the deposit; the aperture is roundish."—"This form of aneurism "almost invariably occurs as a secondary formation, being seated on a cylin-"droid or fusiform aneurism.

"2. In some few cases the circular fibrous coat terminates sharply at the "margin of the aperture in the artery. The aperture is irregular and angu-"larly contracted, whilst the wall of the pouch above it consists of the cellu-"lar sheath, and of a deposit which projects from the contiguous inner surface "of the vessel over the margin of the circular fibrous coat in the form of "bridge-like plates and strings, and adheres loosely to the cellular sheath in "the cavity of the expanded portion of the vessel. This appearance is "observed only in small aneurisms, before they exceed the size of a bean or a "hazel nut, and they commonly prove fatal by bursting. They usually occur "as primary aneurisms, and in general in arteries that are only slightly and "locally diseased. The aperture in the fibrous coat is obviously the result of "loss of substance."

"3. In cases of similarly rare occurrence, we meet with a sharply defined "bulging of the artery, filled with the atheromatous mass resulting from the "disintegration of the deposit and the circular fibrous sheath. The wall is "here composed of the cellular sheath."*

Rokitansky considers the aneurism described under the first head "to be "the result of excessive disease of the coats of the artery at a circumscribed "spot. The artery bulges, and its walls then bend at the margin of the "diseased tissue towards the tube of the vessel with which it forms, as it were, "a duplication of the wall of the artery." Further, he says:—"The appear- "ances considered under the second head, have undoubtedly been developed "from those noticed under the third head; at all events we are unable to "discover in what manner this loss of substance has taken place within the "wall of the vessel, unless by the atheromatous process described under the "third head. We find that the deposit and the circular fibrous coat are "affected throughout and destroyed."†

He continues, "We take the present opportunity of answering the question "whether a rent in both the inner coats of the artery can give rise to the for- "mation of an aneurism of this class? The belief in this mode of origin has "met with almost universal accordance, although, as far as we know, the "correctness of the opinion has never been proved by any one. The cavity in "the neck or pedicle of these last named aneurisms has commonly been "regarded as a fissure. Yet, as far as we are aware, no such rent has ever "been detected, nor have we ever found that a fissure in the inner coats of "the artery afforded a basis for the formation of an aneurism."

I have been thus particular in giving Rokitansky's views, as no one would differ from him unless upon the clearest evidence, and I think this evidence is afforded by Clegg's case, detailed in the Sanitary Report of the Army for 1866, p. 552. In that instance there had been recent pericarditis, accompanied or followed by thickening in the coats of the right side of the ascending portion of the aorta within the pericardium, in the centre of which was a cavity, apparently of an abscess. This communicated with the canal of the artery by radiating fissures extending through the middle and inner coats, with abrupt edges, and at a point where there was no trace of atheromatous degeneration on the inner coat. The cavity of the abscess in this case had constituted the sac, which gave way while it was yet of very small size, but had the pericardium been adherent to the surface of the aorta at the part, the sac would have been sufficiently supported to have withstood rupture so early, and have attained a much larger size, as was found inseveral instances here during the year. Had Rokitansky met with a case resembling Clegg's, I cannot but think he would have modified his views as to the immediate cause of aneurism materially, and have given much less weight to atheroma than he has done. It would be going too far, perhaps, to discard the influence of this degeneration altogether, but certainly aneurism, as I have met with it among soldiers, seems frequently to exist quite independent of that form of disease of the inner coat of the arteries, and destruction of large portions of even the whole three coats may take place by an acute process, and without a trace of atheroma in the neighbourhood, as is clear from the following case:—

Private John Almond, 80th Regiment, aged 28, 10 years' service, was admitted to hospital on 8th April with inflamed tonsils, accompanied by considerable febrile excitement. The left was most affected. Matter formed in it, and on the 11th was evacuated by a natural opening in the anterior part of the tonsil, after which the febrile disturbance disappeared. On 15th at 6·30 A.M., while getting up, he was in high spirits, and, while talking to those about him, a gush of blood came from his mouth; this was florid, and a large quantity escaped, causing faintness. Cold water was applied to the chest and spine, and ice given in small quantities frequently during the day. There was no recurrence of bleeding until the morning of the 16th, when he got up contrary to order, and it returned, and he lost nearly a pint, which came away in gushes, not by vomiting or coughing. Perfect quiet was now maintained, and ice kept constantly in the mouth, and he went on favourably until the 21st, when at

* *Ibid.*, page 280–81. † *Ibid.*, page 281.

3·50 P.M. a violent gush took place, and though pressure was made over the carotid immediately, he died in five or six minutes.

The last attack was preceded for a little by a peculiar sensation in the region of the heart, which induced the patient to think the bleeding was about to recur. On examination the cavity of an abscess was found behind the superior constrictor of the pharynx, about the size of a filbert; this had opened into the pharynx behind the velum by a small aperture; on the other side it communicated with the canal of the internal carotid, the coats of which were destroyed for nearly half an inch in length, and about a fifth of its circumference in width, at a point just before it turns to enter the carotid foramen of the temporal bone. The edges of the opening in the carotid were irregular, abrupt, and thickened as if they had undergone inflammation and ulceration. From what we know of the resistance of the coats of the larger arteries to ulceration, even when passing across an eroding sore or abscess, it appears reasonable to conclude that the vessel in this case was itself originally implicated, and that the resulting abscess opened through the muscle, and not that an abscess first arose there which ultimately led to the destruction of the coats of the vessel. It was a question whether the common carotid should be tied in this case; the difficulty in finding where the blood came from, and its intermittent flow, however, led to its not being done, and after death it became clear that even had the operation been performed, the bleeding most likely would have recurred, owing to the free anastomosis of the vessels inside the cranium, affording a copious supply of blood, which the large breach in the carotid would have permitted it to escape on the first excitement.

In the following case there were two aneurisms, which clearly came under Rokitansky's second division, at the same time that there was thickening of the whole circumference of the vessel, and several commencing dilatations that would come under his first division, but without atheromatous degeneration at the spot.

Private Edwin Fowler, Military Train, aged 31, service nine years, healthy in appearance, steady, temperate, and with great muscular development, went to hospital on 18th November complaining of pain between the scapulæ, which had been increasing for some days, but without cough or acceleration of pulse. Nothing unusual was discovered in the condition of the lungs, heart, or great vessels, nor was there any tenderness in the course of the spine. About 2 P.M. he become rather collapsed, with great uneasiness deep in chest, which gradually extended downwards, and at last was referred to the epigastrium. This was attended with much restlessness, and inability to remain in any particular position; breathing deep and sighing, pulse small and slightly accelerated, and latterly there was a feeling of sickness at stomach, and a sensation as if the bowels were to be moved, but nothing was passed either way. In this condition he died at 4 P.M. On examining the body the coats of the aorta at the commencement of the descending portion were found thickened for between two and three inches, and this embraced its whole circumference. On laying open the vessel at this place, two small aneurismal pouches were found about its centre, and at the inner and back part of the vessel. These were near each other, and had openings about the third of an inch in diameter, with smooth but mamillated edges. The smaller sac was about half an inch deep with its inner surface entire. The other, which could have contained a walnut, adhered to the vertebra at the back, and had given way at the lower part, and permitted extensive effusion of blood into the posterior mediastinum, both upwards, and downwards as far as the diaphragm. At several other points inside the thickened portion were slight, nearly circular, depressions of the surface, showing the resistance of the coats to the pressure from within had been insufficient, and that other pouches were commencing to form. The lining membrane of the vessel displayed moderate traces of atheromatous degeneration, many patches of which had become perforated with numerous openings, as is usual when they are wasting, but the depressions of surface above noticed were free from atheroma in any of its stages. The heart was healthy in size and appearance. The tricuspid and mitral valves were quite healthy. The aortic had slight thickening towards the edges, but were smooth and healthy in appearance otherwise.

This case shows that the inflammation which precedes the formation of

aneurism may embrace the whole circumference of the vessel, and hence affords an explanation of those varieties of the disease denominated true aneurism, in which the calibre of the vessel is suddenly increased without the formation of a distinct pouch on one side, communicating with the canal of the vessel by an opening more or less contracted. Three such examples were met with among the fatal cases in the course of the year; in one of them, Gunner Martin Henley, Royal Horse Artillery, who died on 7th September, the immediate cause being pleuro-pneumonia of left side, the aorta was dilated into a large pouch without any clot in it, and without any distinct sac. In the second, that of Private J. Miller, Military Train, who was also affected with disease of, and incompatency of the mitral and aortic valves, the aorta, after giving off the left subclavian, suddenly expanded into a pouch about 2½ inches in diameter, and circumscribed portions of the walls of this again were commencing to be dilated so as to present a number of secondary pouches; there was no trace of fibrinous deposition in any of these. There was very little trace of atheromatous degeneration in this case; the immediate cause of death was congestion of the lungs. In the third case, that of Private Blake, 98th Regiment, the aorta, about the commencement of the arch, was dilated uniformly to the size of a cricket ball, the inner surface smooth, and without any deposit of fibrine. There was much atheromatous disposition between the heart and sac, some of it calcified. The tricuspid valves were much thickened and incompetent, also the aortic, and the heart enlarged. The case proved fatal through congestion of the lungs and dropsy. The man's condition had been detected in India when he presented himself as a volunteer, and to the last he stated he felt no inconvenience from it.

Occasionally an instance is met with of a distinct aneurismal sac, combined with a general dilatation of the vessel at another part in the vicinity, as in the following case, which presented both features, and with a complete absence of the atheromatous deposit.

Private Joseph Abbot, 54th Regiment, aged 32 years, ten years' service, died of aneurism on 18th June. This had made its appearance a considerable time before, but being on Staff employ he did not report himself until 10th May, when it had caused absorption of the sternal ends of the second and third ribs on right side, and protruded externally. While in hospital the tumour extended up the neck as far as the thyroid cartilage, and ultimately caused absorption of the clavicle. The skin over the upper part of the tumour became thinned, inflamed, and threatened to ulcerate, when he died from exhaustion. The sac arose from the superior portion of the arch of aorta, by a large opening; it was nearly filled with concentric, and firm layers of lymph; it had given way at one point, and from this the blood escaped which had extended through the areolar tissue along the neck, here there was no attempt at fibrinous deposition. The innominata was pervious and healthy, the left carotid obliterated at its origin. The aorta was much dilated between the heart and the sac, and its inner coats puckered, thickened, and rough, but presented no trace of atheroma. The heart and valves were healthy.

In addition to the cases already alluded to, there were four in which sacs of some size had formed within the pericardium, and ruptured into the cavity, in all of which this membrane was adhering firmly over most of the surface of the sac; in one of these there was a second sac outside the pericardium. In another case, that of Private Neighbour, 97th Regiment, who died from exhaustion without rupture, a large sac sprang from the anterior part of the arch of the aorta, and another, the size of a walnut, was formed between the aorta and pulmonary arteries and upper part of the right auricle. It communicated with the aorta by a smooth circular opening that would admit a swan quill, half an inch above the valves. The sac was firm, and contained many layers of fibrine which almost filled its cavity, it was, in short, undergoing a spontaneous cure. Another case had a sac at the commencement of the arch, which burst into the right pleura. In another there was a large sac at the arch which did not give way, but the patient died of exhaustion. In another, a sac at the end of the arch ulcerated into the œsophagus, and after death the stomach and duodenum were found distended with blood, though none had been passed from the mouth. In another there were two sacs at the commencement of the descending aorta, one of which burst into the posterior medias-

tinum, the blood passed downwards as far as the crura of the diaphragm, and then into the right pleura, which contained numerous large clots. In another there was aneurism involving the cœliac axis, which burst into the peritoneum. Of these ten cases there was no atheromatous degeneration in the inner coats of the aorta in three, and in one only were the aortic valves diseased. In five others the condition of the inner coat was not specially noticed; two of these only had disease of aortic valves. In two there was much atheroma, but in both the aortic valves were healthy.

There was one case in which an aneurism arose from the bottom of the sulcus behind the anterior aortic valve, and the sac was formed in the left ventricle, by the endocardium with a few muscular fibres adhering to it, and the upper part of the septum. The cause of death in this case was peculiar, and as there was another presenting much the same characters, but without complication with aneurism, it may be useful to bring both together here.

Private Thomas Pope, 1st Battalion, 20th Regiment, aged 27, service eight years, was orderly to Assistant Quartermaster-General since 10th June. He complained latterly his duties exposed him to the sun, and were harassing. For a short time before his death he seems to have felt much uneasiness in cardiac region, and to have dreaded ascending the hill from the east Infantry block to the Quartermaster-General's Office (about 70 feet elevation). On the evening of 29th February he complained of pain in the region of the heart with palpitation, but next morning took his breakfast heartily, and went to the office. At the usual hour he dined, and shortly before 2 P.M. was sent a message, when he fell down, but immediately after was able to walk to hospital with the assistance of a comrade. At half-past 2 P.M., Dr. Carter saw him, when he complained of pain in cardiac region, with great difficulty of respiration, with slight cough, and much moist crepetation over lungs. Pulse very feeble, temperature of surface natural. At a quarter to 3 P.M. the breathing was much more laborious, and there was profuse expectoration of frothy fluid, slightly tinged with blood. At 3 P.M. he was insensible, collapsed, pulse scarcely to be felt, and the froth oozed up into the mouth, and passed out of the nostrils in very large quantities; he had previously spat a quart into the vessel at the bedside. Sinapisms were applied to the chest, and æther, camphor, and brandy given freely, and latterly Silvester's method of restoring the drowned was employed, but without effect, and he died at 3·35 P.M. The fluid expectorated was alkaline with a number of blood corpuscles in it. It consolidated with nitric acid. Hydrochloric acid was not tried with it. As already stated, an aneurismal sac was found at the upper part of the septum in the left ventricle, this was about the size of a walnut, and had no deposit of lymph in it. When full the sac could not have been emptied during the period of contraction of the ventricle, and as it was protruding over the passage to the aorta, must have impeded the flow of blood into that vessel very materially. The valves and lining membrane of the aorta were healthy. The lungs were much congested, almost hepatized, and the bronchial tubes full of fluid.

The other case was that of Private A. Holdgate, 54th Regiment, which was returned as pulmonary apoplexy. This man, aged 32, was stout, muscular, short necked, and had 14 years' service. On 31st July, after dinner, while employed on fatigue duty, he felt unwell suddenly, and was removed to hospital on a stretcher at 4 P.M. He was then in a low prostrate condition, with irregular intermittent pulse, and continued in this state until about 8 P.M., when cough, dyspnœa, and frothy expectoration came on, and the latter soon presented an admixture of blood. By 11 P.M. the chamber pot was half filled with a thin serous-like fluid, frothed on the surface like soap suds. As this coagulated firmly with nitric and with hydrochloric acids, it was evidently chiefly serum, with but little mucus in it. The dyspnœa at 1 A.M. was extreme, with great thirst, the stomach rejecting everything as soon as swallowed. Pulse 120, temperature 56. Shortly after three the cough and expectoration gradually ceased. At 7 A.M. he became insensible, and died about three quarters of an hour afterwards. At first a mustard emetic was given, and a large sinapism applied to the chest, and ammonia and æther frequently administered. After the cough commenced turpentine fomentations to back and front, with the stimulants and brandy, were employed assiduously,

and warmth applied to the feet. The body was examined 10 hours after, when the rigor mortis was well marked, and there was considerable livor of the back (depending) parts. White froth issued freely from the mouth and nostrils, and on compressing the thorax a continuous stream welled up. On incising the skin the veins bled freely. The heart was somewhat hypertrophied and dilated, valves healthy, walls with a good deal of fat. Right side full of fluid blood. Left ventricle contained a feebly coloured clot attached to its anterior wall. Right pleura firmly adherent throughout. Trachea and bronchial tubes full of frothy serum. Lungs, especially right, much congested, but every portion floated in water. No other indication of disease in them.

The symptoms in the first of these cases might have been attributed to the impediment to the circulation caused by the aneurism, but for the immediate occurrence of the other in which no such obstruction existed; it seems very probable, however, that the extremely rapid course of the disease in Pope was determined by this complication. The weather had been very hot up to 22nd July; on 23rd the maximum was 72·4° only, and it was not above 80° for the rest of the month, except on 27th and 28th, when it rose to 89·4 and 85·4 respectively, but on 29th was 72·8 only. The excessive discharge of serous fluid from the lungs bears some analogy to what is described as occurring occasionally in sun-stroke, but (independently of the cases occurring after the temperature was much reduced) it was not preceded or accompanied by the dryness and excessive heat of skin, or by the other symptoms characteristic of that disease. There was a disposition to cholera at the time these cases presented themselves, and, on 13th August, a man of the 2nd Battalion 6th Regiment actually died of that disease. I am not aware that a connexion can be established between them, but in the absence of any trustworthy explanation of the causes of the former the coincidence may be mentioned.

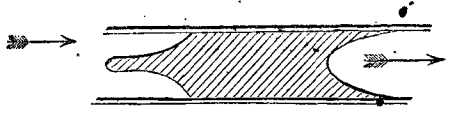
There was an instance of aneurism of the pulmonary artery, a very rare form of disease, and the first I have heard of in the Army. This occurred in Schoolmaster Sergeant James Thane, 98th Regiment, aged 27, who had complained of hoarseness and occasional dyspnœa for about six months before death, but for which no perceptible cause had been detected. On 2nd September he was found dead in bed, his head hanging over the side, and a large pool of blood on the floor that seemed to have flowed from the mouth and nose. An aneurism of the pulmonary artery, the size of a pigeon's egg, was found, which had burst into the left bronchus, by a circular opening two lines in diameter. The sac contained dense layers of fibrine. The bronchial tubes on the same side were filled with blood, but the lungs were otherwise healthy, and there was no valvular disease of the heart,

There were two cases of popliteal aneurism under treatment, which were cured by pressure, and both men have since returned to duty. The subject of one of them was Troop Sergeant-Major Henry Wadeson, 10th Hussars, aged 30, and with 13 years' service, a stout healthy looking man. His horse fell with him at the Curragh on 6th May. Immediately after he marched for Aldershot, and on 12th he felt a sharp pain in left ham, with stiffness of limb, but he continued with his troop until he reached this station. On 7th he came to hospital, with a well defined aneurism as large as a hen's egg; pressure was applied to the femoral artery in front of the thigh, and the pulsation ceased in 70 hours. The limb remained stiff and weak for some months, but he has latterly been able to resume his mounted duties.

The other case of popliteal aneurism occurred in Private J. Dillon, 97th Regiment, aged 30, and 10 years' service, eight of which had been in India. This man was healthy in appearance, but of intemperate habits. He was admitted on 8th November with aneurism in left ham the size of a hen's egg; he had experienced stiffness, numbness, and cramps in the leg for a fortnight before, but was not aware of having injured it in any way. Pressure was applied over the femoral artery in front of thigh, and continued with intermissions until the 20th, when the pulsation ceased, and the swelling then diminished rapidly. The man was discharged to duty on 8th December, and has continued at it since, unless when in confinement.

During the year there was an opportunity of examining the condition of the artery in a man who had had aneurism at the junction of external iliac and femoral on left side, some years before, which had been cured by the

pressure of a 4 lb. weight over the femoral below its site, while on detachment in New Zealand. The subject, Private Charles Carlton, 43rd Regiment, died of dropsy, depending on tricuspid incompatency, on 27th March. The canal of the artery was completely obstructed under pouparts ligament, for about 1¼ inches in length, by a firm fibrous material in this manner—



The coats of the vessel could not be separated from this plug on the one hand, nor from the sheath on the other, the whole being matted together by extremely firm fibrous tissue. There were no distinct remains of a sac perceptible.

From the above details I think it may be concluded that when the dilatation of the vessel is uniform, embracing all its coats, there is little or no chance of fibrinous deposition, and of a natural cure; but, on the other hand, unless secondary sacs form, the simple dilatation seems not disposed to extend indefinitely, and to involve risk to life, so that such cases, as instanced in Private Blake, 98th Regiment, may run on for a long period without the individual experiencing much inconvenience, and even allowing of his undergoing considerable exertion if the heart be not affected.

As soon as a distinct sac is formed, whether directly from the artery, or from a true aneurism, there is a tendency to the deposition of fibrine, and under favourable circumstances as to rest and diet, that will proceed quickly and may ultimately lead to a complete cure. In the case of Boddy, 54th Regiment, the deposition of fibrine was particularly rapid after he was placed in bed, and the size and pulsation of the tumour diminished, and, had the sac not given way so as to permit of extravasation along the neck there seemed every hope of a cure. The case of Neighbour, 98th, in whom a small sac, within the pericardium, was almost completely filled with dense fibrine, shows that even in that most dangerous situation a cure is not to be despaired of. Of course the facility for deposition, and the probability of a cure, will be greater when the opening into the sac is small than when it embraces a larger portion of the calibre of the vessel. When the arterial coats have given was by a rent, and the blood is effused into the neighbouring parts without the intervention of a sac, the chances of a cure, unless the artery itself be secured both above and below the part, are extremely small. Rokitansky indeed says, that inflammation of these sometimes ensues, leading to a deposition of fibrine around the extravasation, and so forming a sort of a sac, but this occurs so rarely that the probability of its taking place in any given instance cannot be regarded as of any practical value.

APPENDIX No. VII.

NOTES ON ANEURISM, &c., AS TO THE PRESENCE OR ABSENCE OF A SOUFFLE IN THORACIC ANEURISMS, WITH SOME REMARKS ON CIRCULATORY DISEASES AMONG SOLDIERS.

By R. Cooper Todd, Esq., A.B., Staff-Surgeon.

Although the presence or absence of any one symptom in the diagnosis of thoracic aneurisms is comparatively unimportant, yet it may not be uninteresting to enquire into the prevalence, or otherwise of a *souffle* in these cases, particularly as there exists a difference of opinion on the point.

There is little doubt, but that the existence of a *souffle* is generally hailed, in suspected cases, as confirmatory of the diagnosis of thoracic aneurisms, and that its absence creates suspicion of the contrary. On this point there is ample evidence. Sir Thomas Watson, for instance, in his lectures, mentions a case in which the celebrated M. Samson was misled, because "no murmur" could be detected. The late Dr. Hope certainly inclined to the belief that a *bruit* was a very constant symptom in these affections, and Professor Maclean, of Netley (Army Medical Reports 1862) remarks with reference to one of these cases, "but the absence of a bruit is very peculiar." On the other hand, some leading physicians in Dublin teach that "a souffle is the exception in thoracic," "but the rule in abdominal aneurisms"; and again Mr. Bredon says (Army Medical Reports 1868), "the presence of a bruit appears to add special interest "to this case."

It is not intended to discuss the diagnostic value of the presence or absence of an aneurismal souffle; for it is well understood that "a loud bruit," as the late Dr. Green remarked, "in any position of the arch, even when combined "with an impulse distinct from that of the heart, is not decisive of the exist-"ence of an aneurism," although it is thought that the character of a bruit, when it is conjoined with other important signs, may possibly lead to an opinion as to the nature of an aneurism, from the sound being diastolic or double; and of course it is remembered that, in speaking of a diastolic aneurismal sound, the term has reference to the diastole of the heart, and not to that of the artery.

The difficulty of forming a correct diognosis in these aneurisms, where the symptoms are not as palpable to feeling as to sight, has been admitted on all sides, and a very strong evidence of the fact has been adduced by the great Laeunec himself, when he mistook for a thoracic aneurism a dropsical pericardium.

This fact may perhaps fairly give rise to scepticism as to the accuracy of the diagnosis in those cases at Netley, which were not verified by the unfailing demonstration afforded by necropsy. To this there is but one reply; that the diagnosis in these cases, and indeed in all those treated in the medical division of the hospital, received the corroboration of the opinion of Drs. Maclean and Fyffe, before it was admitted into the Registrar's Returns, and thus there is presumptive evidence, that errors of judgment made in the first instance were finally corrected, as far as it was possible to do so without dissection.

In 56 months, counting from the beginning of the year 1867, no less than 10,838 patients were admitted into the hospital at Netley. 36 of these were pronounced to have thoracic aneurisms, of which two were probably of the innominata, and the rest of the aorta. From this number we must deduct *five*, because in these there was a doubt as to the correctness of the diagnosis, so that there remain 31 of present interest.

In the previous history of these 31 patients, little was found of any special interest. By a few of the men their disease was attributed to some special accident or muscular effort. In other instances there was a palpable connection between the disease and rheumatism, as the presence of anchylosis of some of the phalangeal joints of the hands seemed to tell. In a few a distinct syphilitic dyscrasia was present, manifested by marks of *quondam* adenitis and traces of nodes, and against one or two intemperate habits were recorded; while others bore the stamp of malaria, phthisis, and scrofula:—but we would venture to affirm, that a similar "previous history" would accompany the investigation of any other special disease, which is found within the wards our military hospitals.

In the morbid conditions revealed by necropsy in these cases, nothing was found to elucidate our subject. In an etiological point of view, however, the revelations were important, as they showed in every instance a diseased condition of the arteries engaged. The same story was everywhere told. The aorta was found "diseased," "puckered." Its inner coat had undergone "atheromatous degeneration," "fatty metamorphosis," and so on; in fact the diseased state only differed in degree, while the same tale pervaded the whole.

As the co-existence of active phthisis with thoracic aneurism has been questioned, it may be interesting here to state that, in two of the cases mentioned, tubercular lung disease was present, and in an advanced condition. In one of these, phthisis was the direct cause of death, and on dissection *two* aneurisms of the aorta were found, one of which had been diagnosed during life. The double aneurisms in this case are in themselves interesting as a fact, because it has been erroneously stated, that the existence of two aneurisms of this nature in the same subject, "is most peculiar and very rare—at least "there does not appear to be any mention of such a circumstance in any case "which is recorded." (Army Medical Report 1867, p. 313).

In this case also it is notable that "no bruit" was detected—evidently it is surmised, because the intensity of the morbid sounds of the more active disease masked any souffle which might have been present; a circumstance which it is believed accounts for the recorded absence of a bruit in many cases, and one which should be remembered in the examination of mixed cases.

In five out of these 31 cases "no bruit" was detected, but a distinct systolic souffle was present in 25, and a double murmur in one. Among the 25 in whom the systolic bruit existed, there was an intermission in one case, (but this was present in the rhythm of the heart also), while in two the pulse was affected, the left being the one influenced in both instances, and five died in the hospital.

The case in which the double murmur was present deserves special notice. The patient was a soldier of the 61st Foot. He was invalided from Bermuda, where he had served but a short time, and had enjoyed good general health. On the right side of the neck a pulsating tumour was visible. It was about the size of a small hen-egg, elastic, expansile, fluctuating, and compressible. It had in fact all the characters of an aneurism, and it pushed its way up from behind the clavicle into the anterior inferior triangle of the neck.

No doubt existed as to the nature of the tumour, but what artery was implicated was not quite so palpable, as the symptoms were referable either to the innominata or the aorta, or both.

This aneurism had existed, the man positively affirmed, and without doubt truthfully, in its present position, and with but little change for 14 years! During all this time he had been a soldier, not engaged altogether, however, in the active duties of his calling, but for the most part specially employed, and this circumstance may account for his disease having escaped medical observation for such a length of time, as it probably must have done, otherwise it is likely that the man would have been invalided, and discharged the Service long before.

In this case the bruit was double, as has been remarked before. It was audible over the chest and across the manubrium, and directly over the tumour. Along the course, however, of the carotids, the double character of the sound was changed, and a single systolic murmur alone remained, loud upon the right, but modulated on the left side. Scarcely more than the eighth of

an inch seemed to intervene between the points, at which the double sound may be said to have ceased, and the single one to have begun, and this led the suspicion that the former was due to the aneurism, and the latter to some abnormal condition of the arteries, either in themselves, or as the result of the proximity of the tumour. The cardiac valves were believed to have been sound.

This patient left the hospital at his own desire, and was "discharged the Service." At this time no change had taken place in his symptoms, or in the appearance of the tumour, which caused him little, if any inconvenience—another remarkable feature—besides its duration, in this interesting case.

The history of an aneurism, somewhat similar in aspect to this one, is recorded in the "Biennial Retrospect" of the New Sydenham Society for the years 1867–8, p. 297. The aneurism was at first "thought to be one of the "carotid artery, involving also the innominata," but it proved on dissection to have sprung from the aorta, so that it is likely that in our case also the aorta was the artery involved.

But to return to our point. The evidence deduced from these 31 cases, is vastly in favour of the prevalence of the presence of a murmur in thoracic aneurisms. This, however, is not in accordance with the experience of writers in civil life. Dr. Sibson, whose well-known researches are so valuable, favours an opposite view. Dr. Green tabulated 12 cases, in the *half* of which the bruit was absent. Dr. Fuller found *only 19 out of 33 in which there* was any murmur, but Dr. Fuller omitted from his calculations those cases in which the aneurism was prominent, while we have taken the cases as they came before us without considering their stage.

It may be well, therefore, to go a little deeper into the subject, at least as far as the limit of our space will permit.

In the records of the many valuable preparations in the Pathological Museum, at Netley, the history, where any exists, of those of thoracic aneurisms points chiefly to matters of pathological and etiological interest. Nothing of moment in reference to the special subject before us can be gleaned from these specimens, because, although out of *forty-five* instances, to which *ante-mortem* histories are attached, the existence of murmur is noticed in *eight*, and its absence is recorded in *three*, yet in the rest there is not any mention whatever of either its absence or its presence during life; but it may not be out of place to mention that a "rough double bruit" is reported to have been present in the history of the case of one of the preparations to which we refer, and that on dissection *three* distinct aneurisms of the ascending portion of the aorta were revealed.

In the Netley Necrological Registers, dating from October 1860, the records of *nine* cases, inclusive of course of those already mentioned among the 31, were found. In *three* of these a systolic bruit is said to have existed, in *two* "no "bruit could be found," while in *four* no allusion was made to either the presence or absence of this sound.

In the published Army Medical Reports *twenty-two* cases of thoracic aneurisms have been reported. In *eight* instances a *bruit* was present, and in one of these it was double, in *six* instances "no bruit" was found, and in *eight* no record was entered; but in one of the last set, it seems to us plain from the context, that the disease was not diagnosed during life, and, therefore, it is probable that no attention was paid to the existence or otherwise of this symptom, and this suspicion is strengthened by finding, that no less than *four* aneurisms of the ascending part of the aorta were found on dissection—an amount of disease, which must have, according to our experience, produced stethescopic signs of the nature under consideration.

Among the *twenty-two* cases which were recorded by Medical Officers, *fourteen* are brought forward by Dr. Lawson, as occurring in men stationed at the Cape of Good Hope, and elsewhere. In five of these death was sudden, and no symptoms were known to have existed previous to death; and, therefore, it is impossible to say whether a bruit existed or not. These cases are, however, of much interest in a pathological sense, and the appearances revealed by the post-mortem examinations would almost suggest the idea—and it is only an idea—that the destruction of the continuity of the coats of the vessels was the work of some parasite, rather than of disease in its accepted

sense, and Veterinary Surgeons have frequently found "hard substances and parisites" in the aneurisms of horses, and, we believe, more frequently in those of asses.

Besides these, which were collected from military sources, we have found published in the "Lancet," from 1st January, 1844, to 31st December, 1868, *ninety-three* cases of thoracic aneurism, 86 aortic, and 7 innominate. The subclavian aneurisms, although truly intra-thoracic, are omitted, because they were regarded rather in the light of surgical than of medical interest. Eighty of these cases were in males, and 12 in females, and in one no sex was stated. In *thirty-seven* a *bruit* had been present, systolic in 25, diastolic in 5, and double in 7 instances, while in 23 "no bruit" could be found.

The following Table represents the results of the whole number of cases tabulated:—

Whence Collected.	No. of Cases.	Syst. Bruit.	Diast. Bruit.	Double Bruit.	No Bruit.	No Record.	Totals.
Netley Hospital ..	31	25	..	1	5	..	31
Necrologic Registers ..	9	3	..	..	2	4	9
Army Medical Reports	22	7	..	1	6	8	22
Lancet, 1844 to 1868..	93	25	5	7	23	33	93
Totals	155	60	5	9	36	45	155

Many of the cases in which there was "no record" of any *bruit* were published on account of their pathological interest, and no history was given. In many others death had happened suddenly, and nothing previously had been known of the sufferers. In some, however, there was palpable oversight in omission, and in others it was impossible to understand, whether the omission was designedly made, with the view of showing that "no bruit" was present, or that it was the result of a mistake in recording the symptoms of the cases.

The following Table shows the ages of the 93 cases collected from the columns of the "Lancet":—

From 20 to 30	4
„ 30 „ 40	31
„ 40 „ 50	24
„ 50 „ 60	8
„ 60 „ 70	7
„ 70 „ 80	1
„ 80 „ 90	1
Not given	17
Total	93

Thus it will be seen that, as far as these cases are of value, the greatest number of aneurisms of the thoracic vessels occur between the ages of 30 and 40 in civil life, and our military records point to the same fact, as the following ages, (tabulated from 36 morbid specimens of the disease, in the histories of which the age was mentioned, from the Netley Museum) prove, and these cases are selected to avoid any doubt as to the accuracy of the diagnosis.

From 20 to 30	11
„ 30 „ 40	16
„ 40 „ 50	7
„ 50 „ 60	2
Total	36

And again from 31 cases "diagnosed as aneurism," collected from our books at Netley, we have the following result:—

From 20 to 30	12
„ 30 „ 40	15
„ 40 „ 50	4
Total	31

The high ratio of cases between 20 and 30 years, as compared with the Table of the cases collected from the "Lancet," will be apparent to everyone, but the items for comparison will probably be regarded as too limited to be of any statistical importance, although significant.

It seems to be generally believed that the mortality from circulatory diseases is greater in military than in civil life. This, if a fact, is a serious matter, because the excess must be even greater than that which the statistics show, in consequence of the number of invalided soldiers who pass from the Army back to civil life, and thus, when they die, help to increase the mortality from these diseases in the civil statistics. Dr. Lawson has shown without doubt that the statistics, so far as they can be trusted as conclusive, prove that this excess in the military mortality does exist; but it may be fairly questioned if those in civil life are equally trustworthy with our military statistics, when it is remembered, that *autopsies, which are the only infallible* means of arriving at the true diagnosis, is but seldom practised in civil, as compared with its almost universality in military medical investigations; and to render statistics in these questions really conclusive the *cæteris paribus* ought to be fully established.

In speaking of ætiology we would be understood to draw a distinction between the *cause* and the *origin* of disease. We regard the former as primary, and the latter as secondary in the effect—that is to say that, although a muscular exertion or accident may be the immediate *origin*, as far as we can see, of an aneurismal swelling, yet the *cause* lies deeper in some dyscrasia, or diseased condition of the vessel; and the atheromatous condition, which almost always accompanies vessels which are the seat of aneurisms, lends weight to this observation.

"An artery," observed the late Mr. Porter, "must have undergone some "change predisposing to aneurism," to render it obnoxious to this disease, and Dr. Blakiston writes "as long as we are ignorant of the direct causes of athero-"matous degeneration of arteries, on which aneurisms principally depend"; and again Mr. Holmes states: "but none of the ordinary events, which are "looked upon as exciting causes of the disease, can produce it without a pre-"disposing cause in the condition of the artery itself," and these remarks would seem to imply, that these writers wished to distinguish the *cause* from the *origin* of these affections; and the fact that aneurisms form in vessels in which there is no sign of disease appreciable by the anatomist, does not effect these statements.

Adopting then these views, it seems probable that, whatever may be the intrinsic cause of arterial lesions, in a physiological point of view, it is likely to be the same in the military as in the civil population. This assumption is strengthened by Dr. Lawson's statistics (Army Medical Report, vol. viii.), which show that these diseases are not only on the increase in military, but also in civil life, so that one and the same influence must be at work in both. This increase cannot altogether be accounted for by any advancement in diagnostic knowledge (a point to which Dr. Lawson is quite alive), because, although skill in this particular may account for an increase *in the admissions* into hospital under this class, yet it cannot account for the increase *in the mortality*, although of course the advance in this science would in some instances lead practitioners, in the absence of a post-mortem examination, to certify to the disease as a cause of death in more cases now than formerly.

But besides this increase, common to both military and civil life, there seems to be, if statistics on this point be true, evidence in favour of an excess, beyond this common accession, against military life; and the Tables given above, trifling as they are, decidedly give evidence in favour of the excess. It

is, therefore, plain that whatever influence may be at work in the production of, this increase in the circulatory diseases among the population, civil and military we must look to something peculiar in the habits, life, and customs of the soldier, for any excess in the mortality from these affections which may be recorded in military statistics above those in civil life, and we would add that all statistics of this kind, to be confidentially reliable, should be verified by mortality and necropsy, rather than by diagnosis alone.

Dress and Accoutrements. Now, one of the differences between civil and military life lies in the nature of the soldier's dress; and consequently, to the pressure on the thorax produced by this, and the straps of his accoutrements, the excess in the ratio of these diseases in military life, has been ascribed.

Without entering fully into this matter, which would involve the consideration of questions of pathological interest, we will only briefly record a few objections which to our mind seem fatal to this theory.

1st. Considering the nature, as far as we as yet know, of atheromatous deposits, it is not easy to see how such an external influence, such as the pressure caused by a tunic or belts, could produce such an organic arterial lesion; yet this is the nature of the primary "starting-point" of the disease in the arteries affected with aneurism, as the specimens in our Museum, in almost every instance, amply testify. Pressure of this kind, particularly under exertion, might possibly so interfere with the balance of the circulation as to weary out the muscular coat of an artery, and thus impair the resilience of the vessel, giving rise to dilatation, but this is not the form of aneurism common in the military dead-house. Atheromatous degeneration is almost universally found; and we believe that such an exciting cause as dress would be unable to produce such an effect, whether we regard these atheromatous masses as exudations or deposits, or specific growths, or, with Virchow, as fatty metamorphosis whose "starting-point" lies in "inflammation of the inner arterial coat."

2nd. If the pressure of dress and accoutrements could produce such an effect on the arterial system, the disease should be more common among women, who wear stays, than among men whose dress is loose. Such, however, is not the case, aneurisms—thoracic and otherwise—being by a large proportion the inheritance of the male sex; and this cannot simply be accounted for, as the late Professor Porter of Dublin has observed, by the difference in the modes of life of the two sexes, as far as labour is concerned, because women in a certain class of life work quite as hard as their lords; and besides, Nature has supplied the man with stronger and thicker arteries (Todd's Cyclopædia).

3rd. The effect of pressure of this kind would be more likely to produce disturbance in the cerebral circulation than in that of the thorax.

4th. The greater number of these aneurisms, in our *military* experience, are in the persons of soldiers from foreign stations, where knapsacks *are never carried*, and many of the sufferers are *Cavalry* soldiers; while, on the contrary, the majority of cases ought to come from our large camps at home, where field days in heavy marching order are rife, even on our hottest days in the year.

5th. The acknowledged improvements in the dress and accoutrements of the soldier, ever since the Crimean war, ought to have produced their effects by *lessening* the ratio of these diseases. Dr. Lawson shows us, however, that the opposite is the fact; and his statistics go further, and prove that the ratio is greater, even under all the improvements, than it was in the days when gigantic knapsacks, breastplates, and cartouche-boxes were in vogue. The "soldier's spot" on the heart is probably allied to atheroma, and is found in civil as well as in military subjects, as those who have read "Harrison's Dissector" will probably remember.

The way in which the dress of the soldier *might* favour the development of aneurism is by its being unseasonable in its nature, and by its effects upon the temperature of the body. Wearied and overheated, perhaps hungry, and most certainly thirsty, the soldier, on returning from a wearisome march or field-day, drains, perhaps, his quart of beer, throws off his accoutrements and tunic, and thus, on the one hand, impairs his appetite and digestion, and, on the other, exposes himself to chills, from the rapid evolution of heat, and to other influences which favour the development of rheumatism, and such diseases having an affinity for cardiac and arterial complications; and it is an error to suppose

that acute rheumatic fever is alone responsible for these effects; because, if fatty degeneration can specially localize itself in the cornea, or the rheumatic poison select the sclerotic coat of an eye, there is nothing inconsistent in supposing that the same deleterious influence may choose, as a starting-point, the inner coat of the aorta, and thus (if we adopt Virchow's theory) produce atheromatous degeneration and aneurism.

Syphilis.—With respect to syphilis, little is known about its real influence on arteries. Both syphilis and mercury have been blamed for the production of aneurism, but the aneurismal diathesis has been found where no such exciting cause could be traced; and it is considered by Mr. Holmes that "the "assertion is gratuitous."

Lancereaux also remarks that "our knowledge concerning the syphilitic "affections of the arterio-venous system is slight"; and the same author states that these lesions have an affinity for certain arteries, "most frequently the "carotids and their branches."

It may be predicated, however, that a disease which is known to affect every corporeal structure, including the carotid arteries (according to Lancereaux), is also likely to influence the aorta or the innominata. This theory then would perhaps account for any increase in the military ratio, as compared with that in the civil statistics of these diseases (although many objections are patent), because syphilis is undoubtedly present in all military stations; but it fails to account for the supposed *increase* in the military ratio of the present as compared with the past generation, for not only was syphilis quite as rife among soldiers thirty years ago as it is at this time, but the treatment of the disease has been better understood and practised, to a marked degree, during this advance of time.

It may be argued, however, that the type of syphilis has partly changed, and that it has an affinity now, under certain conditions, for the arterio-venous system, which was not observed in former days; and that, as far as the treatment is concerned, the Military Surgeons (to whom the origin of the reformation in the treatment by mercury is fairly due) have rushed from the one—the mercurial—to the other—the non-mercurial—extreme, and thus favoured the present increase in syphilitic arterial diseases; and Dr. Beaty's remarks before the Members of the British Medical Association at their last meeting, unfounded as they appear to us, would have a tendency to support such a theory, but such a support is only ideal.

Alcoholic Drinks.—It is generally stated that the abuse of alcoholic drinks is highly favourable to the production of arterial diseases. Dr. Wilks writes, "I am not sure that intemperance does not lead to disease of the arteries, "chronic laryngitis, and enlargement of the heart from degeneration of the "muscular fibre." Mr. Holmes also believes in the degeneration of arteries produced by alcoholic excesses. Other authors might be quoted who entertain the same idea, and we were certainly struck, in reading over the histories of the cases which we have collected from the "Lancet," with the number of inebriates who were the victims of aneurisms; yet we are ignorant of any statistics which show that persons who have laboured under even frequent attacks of delirium tremens (a proof that the system had been thoroughly poisoned by alcohol) were specially obnoxious to aneurisms or to atheromatous degeneration of the arteries, although of course instances are not wanting.

Excess in alcoholic liquors, especially in those of the fermented and sugared classes, has always been regarded as favourable to the development of fatty degeneration, rheumatic and gouty disorders. The Scotch and Irish, who drink whisky, are supposed to be comparatively exempt from gout, with the Germans and English, whose favourite beverage is beer. We suspect, however, that the whole blame cannot be laid to the beer; and, as far as we know, aneurisms have no predilection for the Scotch and Irish in preference to the English and Germans, or *vice versâ*.

All alcoholic drinks are used in a deleterious excess by soldiers in general. Take a canteen return of any regiment stationed at Aldershot, for instance, during the "season," and compute the quantity, per gallon, of alcohol consumed by a battalion of 600 strong, and divide this total by 600, and the result, we believe, would be incredible to our non-military readers. Civilians, as a

rule, could not afford money or time to the consumption of liquor at a similar rate, and would probably lose their employments if they did.

Tobacco.—To the excess in the consumption of alcohol, we must add a similar excess in the consumption of tobacco, of the strongest and most juicy nature. The "smoker's heart" has been talked of before now; and as everything, speaking in general terms, "may be," as Mr. Holmes has said, "a cause "of aneurism, which destroys the balance that ought to exist between the "expansive force of the circulation and the reaction of the wall of the artery, "so as to make the former predominate," so the excess in the use of tobacco, when it excites the heart's action inordinately, may be the origin of aneurisms in arteries predisposed to the disease; but, exclusive of this, it may so derange the functions of the stomach as to interfere with the proper assimilation of food, which gives rise, in fine, to those dyspeptic symptoms which are so often the forerunners of the development of those diseases depending upon idiocrasy, among which we are much disposed to count the so-called atheromatous degeneration.

This idiocrasy, we believe, might lie dormant through life, were it not roused into being by external circumstances, and among these, as far as a soldier's life is concerned, climatic influences, malarial poisons, exposure to changes of temperature (as soldiers "on guard" certainly undergo), a gregarious mode of life, imperfect ventilation at night, combined with the excessive worship of Venus and Bacchus, rank as the chief predisposing causes.

Recruits.—Our recruiting system is also at fault. The youths who join the Army are not selected from the country lads who follow the plough or the harrow, but from the rakes of our large towns and villages, whose inveterate vices drive them from civil employment to take the shilling from the recruiting Serjeant. These youthful debauchees have frequently impaired their constitutions by their habits of life prior to enlisting; and although they may properly and rightly be deemed "fit to enlist" by the examining Surgeon, yet the seeds of disease, which are beyond the Surgeon's ken, have already been sown to bring forth their fruit in an early death.

In conclusion, we would remark upon the "penny wise" principle of employing inexperienced men in the medical examination of recruits. In the Army Medical Reports for the year 1867, page 35, it is shown "that the pro-"portion of recruits *rejected* on secondary inspection, but primarily passed by "Army Medical Officers, was 41 per 1,000"; while of those "primarily passed "by civilian practitioners, *i.e.* by gentlemen inexperienced in this particular, "the number was 139 per 1,000"! The same return shows that 5,895 recruits were passed into the Service by civilian certificates.

It is easy to account for the prevalence of these diseases in military life, or even for the supposed excess, so many influences are at work. It is, however, not quite so easy a matter to understand why there should be an increase of them in both civil as well as military life. The condition of the soldier has of late years been greatly improved. Humanity and Science have advanced—slowly it is true, but still an advance has been made—inch by inch, fighting against prejudices and ignorance. Important improvements have therefore followed in the soldier's dress, barrack, food, means of amusement, and medical attendance. In every respect, excepting perhaps in the physical quality of the recruits, there is a vast change for the better; and although the camping system, so much in vogue since the Crimean war, may possibly contribute towards the development of arterial disease, yet this is but an item of a trifling nature, compared with the hosts of things which in days gone bye ought to have tended to produce this result. It must also be borne in mind, that of late years we have been "weeding" the Service of men whom the country was forced to take by the emergencies raised by the Crimean war and Indian mutiny; and it is likely that, in some respect, the increased mortality and invaliding under circulating diseases may be owing to this circumstance. These considerations, however, will not bear upon the civilian side of the question.

We are inclined then to conclude that the excess in these diseases is, on both sides, only apparent, and is to be accounted for by *increased accuracy of observation*, not only in a diagnostic but in an anatomical sense. That there is a slight excess on the side of the military over the civil population, mainly

due to climatic influences and habits of life to which civilians are, as a rule, not exposed, as also to errors in enlistment; and that much of the present supposed excess appears greater than it really is in military, than in civil spheres, on account of the dissections so universal in Army practice; for instance, a death which in civil statistics would be recorded, in the absence of a *post-mortem* examination, as hæmoptysis, would in our military returns find its true name—aneurism—the obscurity in the diagnosis having been cleared up by necropsy.

APPENDIX No. VIII.

NOTES ON VACCINATION.

By J. LAMPREY, M.B., Surgeon 67th Regiment.

As an instance of the unusual number of positive results attending the re-vaccination of the recruits of the 67th Regiment, of late, the following record of the re-vaccination of a batch of 27 men will suffice. Of this batch, 15 were recorded under the head of "perfect vaccine vesicle," 3 as "modified," and 9 as "failures." On the 9th of July, the re-vaccination took place. The source of the lymph was from two infants of the regiment, who were vaccinated on the 2nd of July, from a child who had been successfully vaccinated from ivory points. These infants were healthy, and to all appearances free from any inflammatory action whatever. The vesicles were fully developed, and the areolas were of that modified character observed in all the children I vaccinated of late. In former years it was usual to find a large areola around the vesicle on the eighth day; now there is usually a narrow circumscribed ring immediately round the margin of the vesicle; on the ninth day this ring may be seen just faintly extending, as shown in the illustrations B and C. It is not until the 11th or 12th day that the areola becomes fully developed. Illustration D is an exception, which I have only lately noticed. And yet the results obtained from these modern vesicles were attended in several instances with much affection of the cellular tissue, being accompanied with a large diffuse areola, as seen in the drawings of the cases of White and Pierce. In other instances, as in the cases of Johnston, Pitt, and Lewis, though the vesicle had attained the proper development, and contained lymph, there was considerably less of this inflammatory action; and as the recruits were apparently of the same standard of good health, I am at a loss to understand why there should have been such inequality in the results, unless that is to be explained by the supposition that the degree of protection derived from previous vaccination was different in each individual, and thus indicating what might have been the character of the attack of small-pox, the individual might have expected were he exposed to contagion. It cannot be supposed that such exaggerated results in the re-vaccination of some were to be attributed to any specific morbid element other than vaccine, conveyed through the vaccine lymph from the child's body; such, for instance, as syphilis or tubercle; nor should it be attributed to the more active and more fully developed vital force of the adult body when dealing with morbid matter, for if such were the case we might expect a greater uniformity of the results. I was induced to make these notes of cases and drawings accompanying this report, with the view of closely watching the results of auto-re-vaccination, so that had there been any syphilitic taint in the vaccine, I might have expected that the auto-re-vaccination would have produced results analogous to the auto-inoculation of chancrous matter, and this will probably be found the only immediate test of the syphilitic element in vaccine. The possibility of syphilis and vaccine co-existing in the same vesicle remains to be determined. I have the recollection of a case of an infant labouring under syphilis, who had been vaccinated, and on the eighth day it was vaccinated from its own vesicle, with a positive result. Circumstances unfortunately prevented a continuation of the experiment, but I have no doubt the vaccination could have been repeated again and again, as in inoculation of chancrous matter. I regret to have to state that in the two cases of Johnston

and Lewis, where the results of auto-re-vaccination appeared to be continuous or progressive, I was unable to complete the observations, as both these men deserted on the seventh day. In the other two cases the redness about the auto-re-vaccination puncta declined on the second or third day.

I have also taken the opportunity of again vaccinating the re-vaccinated with vaccine from a fresh source, and in these instances the result was barren, thus indicating the completeness of the protecting power of re-vaccination.

I may state that in the month of August the vaccination return shows more positive results from re-vaccination; in eight men who were re-vaccinated six were recorded as having "perfect vesicles," two as being "modified," and none as "failures." In one of these cases a vesicular-looking abscess, with a large vascular areola, formed over the shoulder of the arm operated on, I made inoculation with lymph from the surface of it, as it appeared on the 2nd of September, but the results proved negative. There is a drawing of this case.

In another man of this batch, a small phlegmon has formed over the elbow-joint below the re-vaccination vesicles, which had scabbed. The lymph by which all this batch were vaccinated was derived from one child who had been vacinated from ivory points.

The following are the detailed cases of the accompanying drawings :—

Case of No. 1,518, *White.*—Re-vaccinated on the 9th July, 1869; inspected 16th July, 1869; returned as a "perfect vesicle."

Appearances of arm on the 16th July, 1869: Vesicles well-formed, depressed in centre, darkening, contain lymph, surrounded by a diffuse areola, more vascular immediately around the vesicles, outer areola extends for about three inches down the arm, and one inch above the vesicles.

Made two punctures on the opposite arm and made auto-vaccination with lymph from the vesicles, as described above.

July 17th.—Areola extending on the arm above and below the vesicles, the centre areolas are not so vascular-looking. The vesicles are much the same as on the 16th. The auto-vaccination puncta have a slight redness about them; there is a mere raising of the punctured spot.

July 18th.—The vesicles are broken on the surface, areolas are paling, the redness about the puncta is fading.

July 19th.—The areolæ have all but disappeared. The vesicles have scabbed, the auto-re-vaccination punctures have disappeared.

July 23rd.—Again vaccinated this man from a fresh source of lymph.

July 30th.—Re-vaccination negative.

Case of No. 1,532, *Pierce.*—Re-vaccinated on the 9th July, 1869; inspected 16th July, 1869; returned as a "perfect" vesicle.

Appearances of arm on the 16th July, 1869: Vesicles well-formed, depressed in centre, darkening; contain lymph, surrounded by a diffuse areola, with a more vascular space immediately around the vesicles.

Made three punctures on the opposite arm, and made auto-vaccination with lymph from the vesicles described above.

July 17th.—Areola spread wider than yesterday; not so vascular in the centre. There is a redness around the punctures of re-vaccination of yesterday, and a slight prominence.

July 18th.—The circumference of areola is larger. The centre of the vesicles has broken slightly, and exudes clear fluid lymph. A few prominences of the skin, like papillæ, have formed about the wrists. The redness about the re-vaccination puncture has declined considerably.

July 19th.—The areola of the vesicles is fading. The punctures of auto-re-vaccination have disappeared.

July 20th.—Tho areola of the vesicles has faded.

July 23rd.—Re-vaccinated from a fresh source of lymph.

July 30th.—The last re-vaccination is negative.

Case of No. 1,851, *Johnston.*—Re-vaccinated on the 9th July, 1869.

Inspected the 16th July, 1869. Returned as "perfect vesicle." Appearance of arm on the 16th July, 1869.—Vesicles well formed, depressed in centre, and darkening; contains lymph. A small areola has formed around each vesicle, with indications of a larger area of areola around.

Made three punctures on the opposite arm, and vaccinated with lymph taken from the vesicles described above.

July 17th.—Areolæ around the vesicles are less vascular, and more circumscribed. The punctæ made for auto-re-vaccination have a small red circle around them, and a slight amount of prominence.

July 18th.—The areolæ of the vesicles extending over the arm. The redness around the punctæ is slightly extended. The punctæ have more prominence.

July 19th.—The areolæ around the vesicles are less. The red circles around the punctæ are more extended. There is also more prominence.

July 20th.—The vesicles are becoming scab-like. The areolæ are more contracted, the punctæ are more prominent, and their apices are broken and exude lymph, which hardens.

July 21st.—The vesicles are more scab-like. The areolæ are subsiding.

The apices of the punctæ are broken, and exude lymph from a larger surface; one has a vesicular character, with a depression in the centre. The redness surrounding them is more vascular-looking.

July 22nd.—Apices contracted in area. Areolæ also contracted and paler.

July 23rd.—Recruit deserted.

Case of No. 1,508, *Pett.*—Re-vaccinated on the 9th July, 1869.

Inspected the 16th July, 1869. Returned as "perfect vesicle."

Appearance of arm on the 16th July, 1869.—One vesicle, though angular in outline, is well formed, depressed in centre, darkening in centre, contains lymph, and is surrounded by a moderate areola.

Made three punctures on the opposite arm, and vaccinated with lymph from the above-described vesicles.

July 17th.—The areola around the vesicle is extending. The punctæ are surrounded with wide red circles of a pale colour. There is no elevation.

July 18th.—There is a large circumference of areola. The vesicle is not broken. There is slight prominence of punctæ and diminution of red circles.

July 19th.—The areola is subsiding. The re-inoculation punctæ are fading.

July 20th.—The areola is subsiding; the punctæ have almost disappeared. Same at 19th.

July 23rd.—Re-vaccinated from a fresh source of lymph.

July 30th.—Re-vaccination, negative.

Case of No. 1,509, *Lewis.*—Re-vaccinated on the 9th July. 1869.

Inspected on the 16th July, 1869. Returned as "perfect vesicle."

Appearances.—Vesicle irregular in outline, depressed in centre and darkening, contains lymph. There is a moderate areola, with an inner areola, more vascular, surrounding the vesicle.

Made three punctures on the opposite arm, and vaccinated them with lymph from the above-described vesicle.

July 17th.—The areola is more developed and extended. The punctæ present unequal appearances, one is raised and surrounded with a red circle, another has a less marked circle of redness, and the third is very faintly marked.

July 18th.—The vesicle is becoming darker in colour, and the areola surrounding it much paled. There is a mottled appearance about it. One of the punctæ appears raised, with a redder circle surrounding it; the others appear aborted.

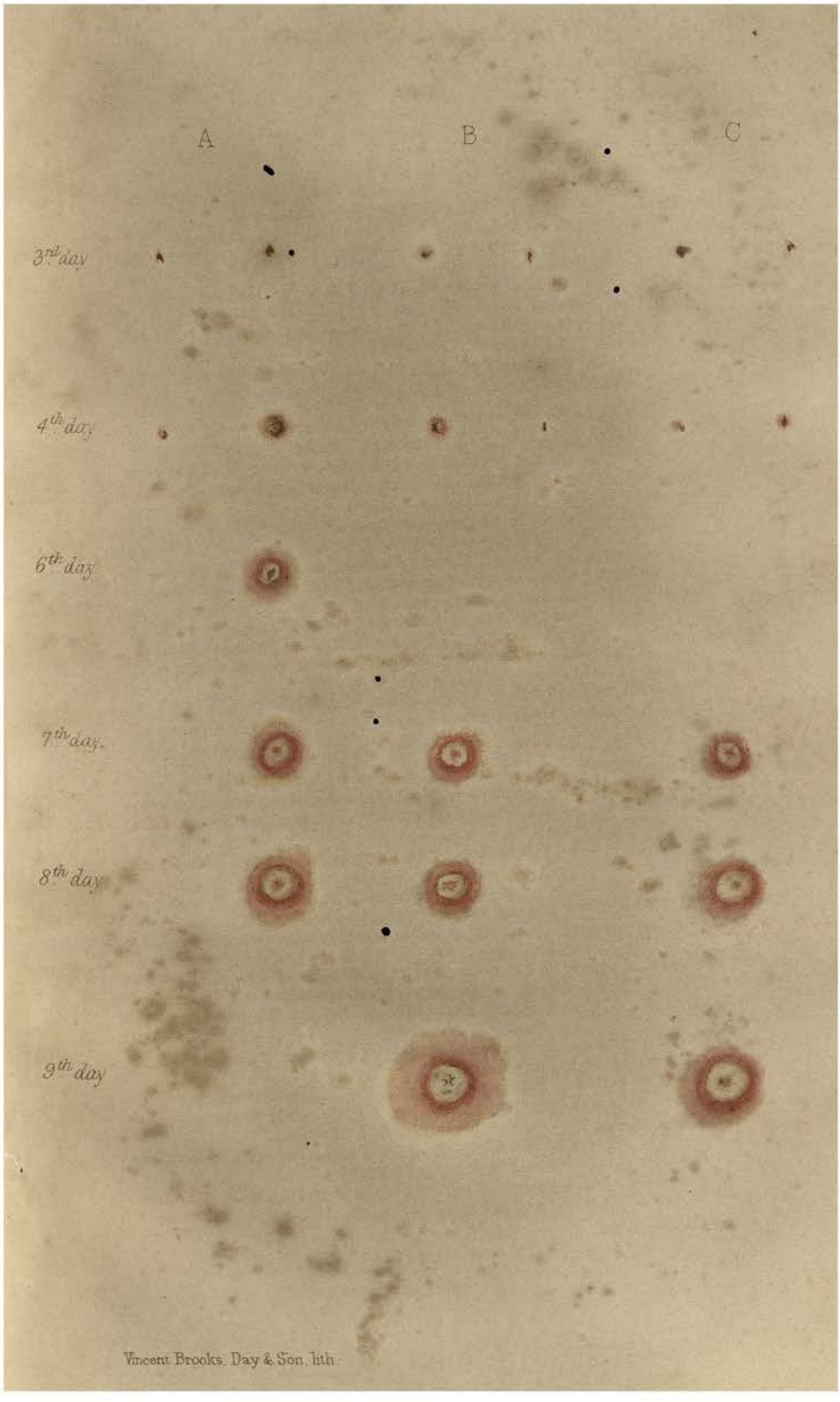
July 19th.—The puncta is more prominent, lymph exudes from the apex of it, and the redness around it more diffused.

July 20th.—The vesicle is forming a seat, and the areola surrounding it is fading. The puncta is still prominent; its apex is broken, and covered with a lymph crust, and having a vascular margin round the break.

July 21st.—The redness surrounding the puncta is less diffuse and mottled. The apex resembles in appearance that of the 21st.

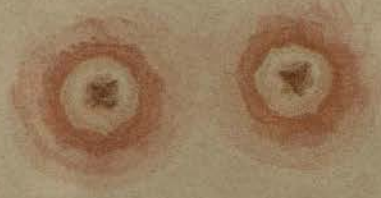
July 22nd.—The redness surrounding the puncta is fading, with an inner more vascular ring. The break at the apex is smaller.

July 23rd.—Deserted.


A
B
C
3rd day
4th day
6th day
7th day
8th day
9th day
Vincent Brooks, Day & Son, lith.

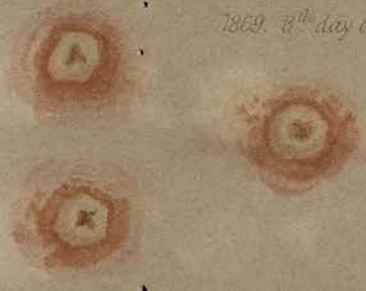
Child of M^rs M^c Gen. R.E. Train
vaccinated 27^th August 1869
drawn on 3^rd Sept^r 1869. the 8^th
day of vaccination

D



Child of M^rs Weller 67^th Regiment
vaccinated from the above on the
8^th Sept^r 1869 drawn on the 11^th Sept^r
1869. 8^th day of vaccination

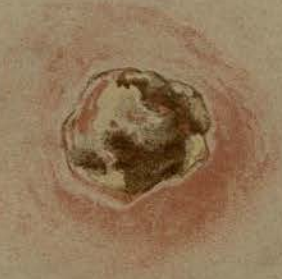
D



Vincent Brooks Day & Son Lith.

SEQUELA OF VACCINATION.

Re-vaccinated 18th August
bears marks of previous vaccination.



first appeared on the 29th of August, a small boil a little below the acromion process of the re-vaccinated arm drawn on the 2nd Sept.r 1869.

Sept.r the 6th healthy granulations cover the surface — areola has disappeared.

6th Sept.r 1869 aborted no result.

made two punctures and inoculated him from the phlegmon 2nd Sept.r 1869.

Re-Vaccinated 18th Aug.t inspected on the 26th pronounced perfect. drawn on the 2nd Sept.r 1869.

Vincent Brooks Day & Son lith.

16th July.

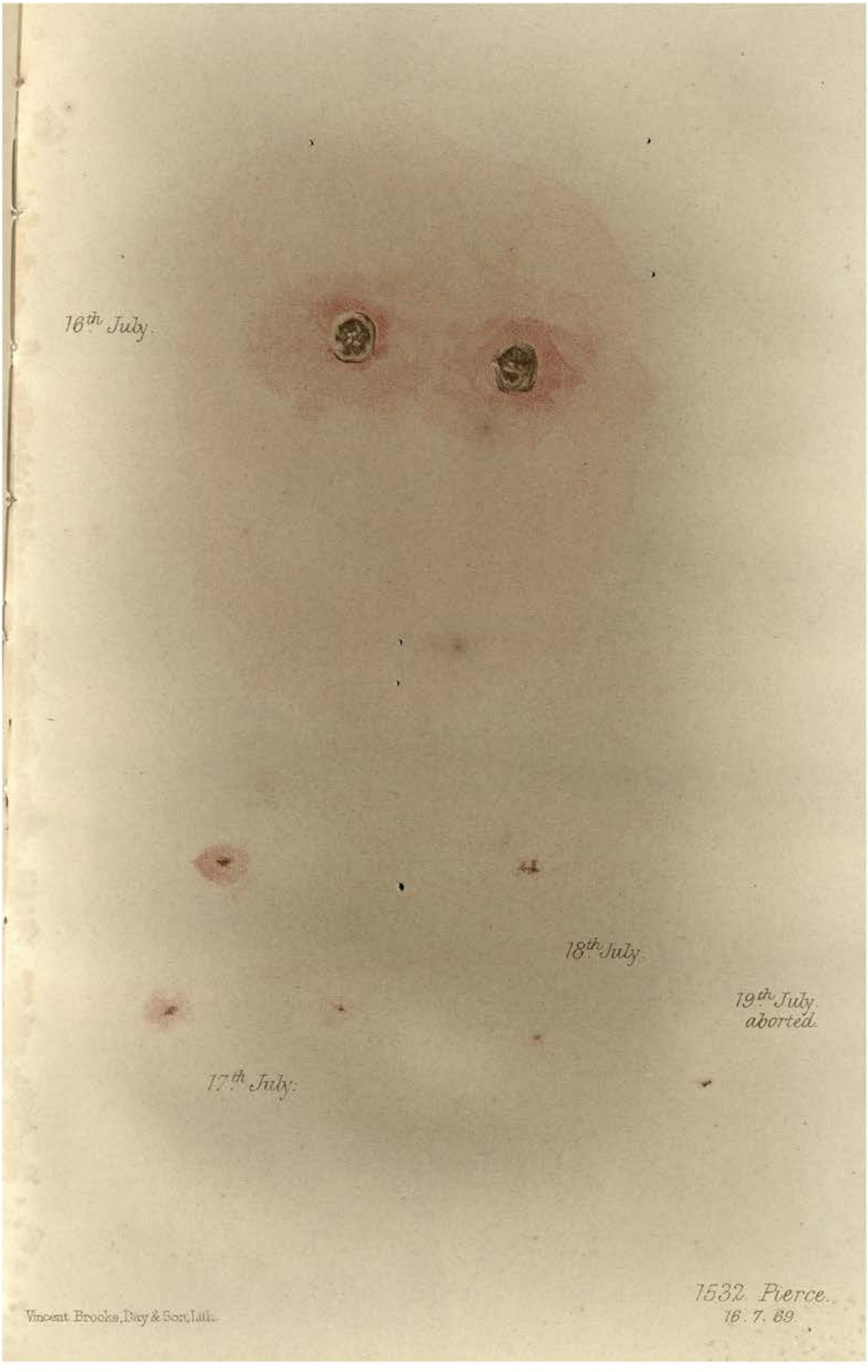
17th July.

18th July.

19th aborted.

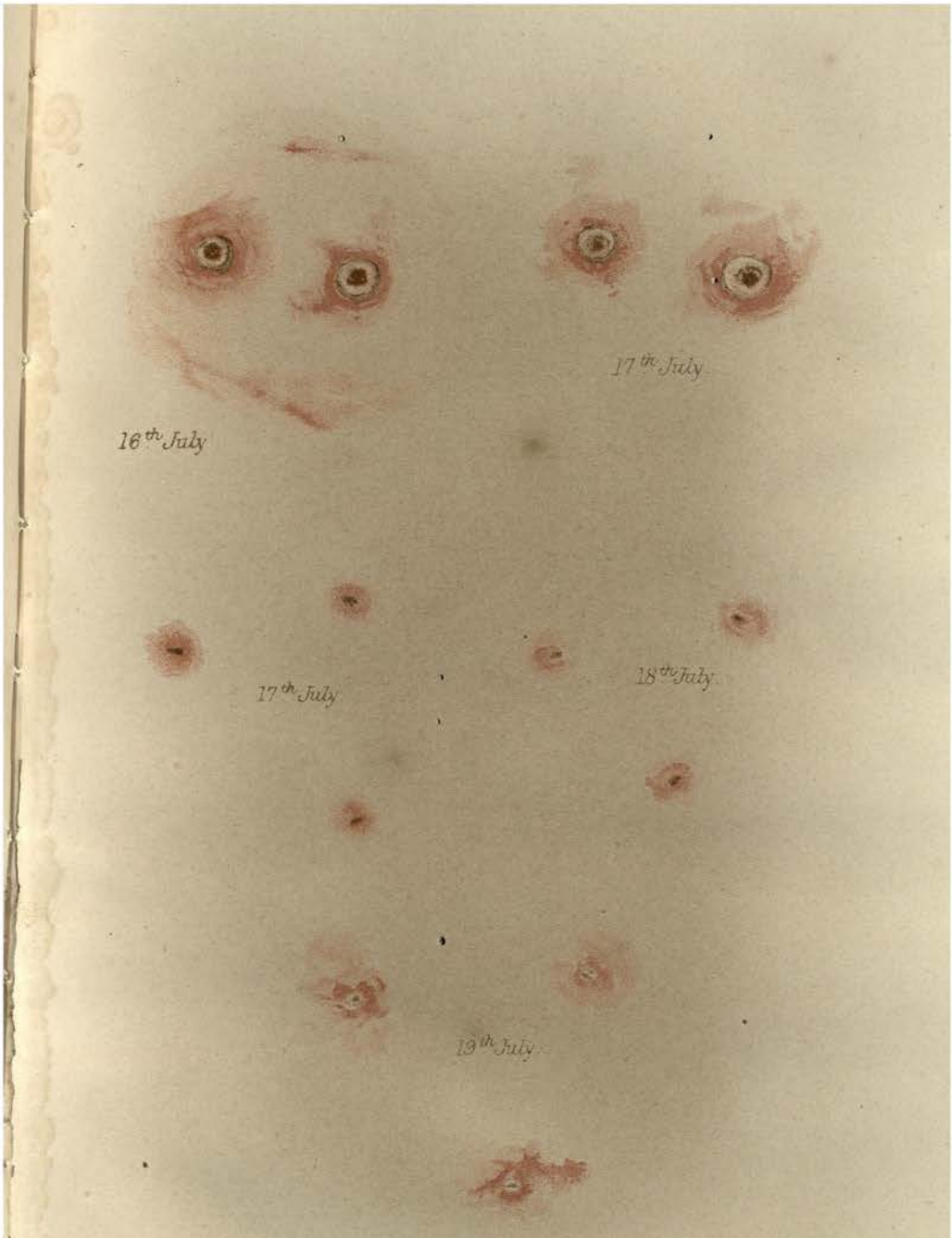
1518. White.
16. 7. 69.

Vincent Brooks, Day & Son, Lith.



Vincent Brooks, Day & Son, Lith.

1532. Pierce.
16. 7. 89.



W. & J. Johnston
16. 7. 69.

Vincent Brooks Day & Son, Lith.

20th July.

20th July.

21st July.

22nd July.

1551 Johnston.
16. 7. 69.

Vincent Brooks, Day & Son, Lith.

16th July

17th July

17th July

18th July.

19th July

Vincent Brooks Day & Son. lith.

20th July
same as 19th July

16th July, 1869.

Vincent Brooks, Day & Son, Lith.

1509 Lewis
16. 7. 69.

APPENDIX No. IX.

THE CORRELATIONS OF TEMPERATURE, PULSE, AND RESPIRATION IN PHTHISIS.

By Assistant-Surgeon BOILEAU, M.B., 29th Regiment, Quebec.

THERE is at present a widely extended belief that the thermometer is, of all our aids to diagnosis, one of the most reliable in the detection of tubercular disease of the lungs. It is of the utmost importance that we should be acquainted with the real value of the instrument, as otherwise serious errors may occur; in addition to which the thermometry of disease will be unjustly impugned as a powerless means of diagnosis. The truth appears to be this, that the positive evidence of elevated temperature in a doubtful case of tuberculosis is of great value, whilst the absence of such elevated temperature is no proof that tuberculosis is not present. It is not even a proof that tuberculization is not in progress, it is not even a proof that any fractuosities have not occurred in the lungs.

I have demonstrated that a person may progress to the stage of tubercular cavities in his lungs without exhibiting general elevation of temperature. And as this demonstration is of great consequence, I will give it *verbatim* from my case books, in order that the proofs may be scrutinised by those who are more experienced than I am.

I must admit, in deference to the opinions and experience of the well-known writers on the subject, that I have met with at least one rather exceptional case; but provided only that the circumstantial fidelity of the narrative is unquestionable, it alone must be of the greatest value, as a proof that tuberculization of the lung may occur without general elevation of temperature.

Private J. McC., aged 27, service eight years, was admitted into the Regimental Hospital of the 29th Regiment in Hamilton, Canada West, on the 21st February, 1868. He had had very few entries in his medical history sheet. In 1863, dyspepsia gave him 44 days in hospital, and in 1865, during the cholera season in Malta, he was ill for seven days with diarrhœa. During the last eight years, he had thus been only twice in hospital. His parents, brothers, and sisters, strong and healthy, and previous to this year he had been so himself. Latterly, he had become subject to colds, and within the month he had been troubled with pulmonary distress and cough. He was a fair complexioned man, with blue eyes, and very white conjunctivæ; voice was hoarse.

February 24th. Five observations have been made on this man's temperature—three mornings, viz., 98·6, 98, 98 2; and two evenings, 98·4, 98·2: average 98·2. His temperature is, therefore, normal. Judging from this fact, and from his general appearance I do not expect to find anything very serious the matter with him.

He complains of a "cough and spitting," weakness, and a pain in the right hypochondrium when he takes a full breath. His voice is hoarse and weak, his breathing is quickened, the sputa is a mixture of froth and puriform detached masses, the skin is soft and delicate. Percussion yields a much duller sound from the left clavicle than from the right, and the infraclavicular region of the left side is also duller than the corresponding right, but the difference gets less and less marked as we approach the mammary region. Percussion of the scapular region gives no reliable information. The respiratory sounds are very feeble indeed in the upper lobe of the left lung, whilst they are of normal strength in the right. Posteriorly they are rather feeble

throughout the left, but positively puerile in the right; they are pure everywhere except under the clavicular and infra-clavicular regions of the left side, where there is an occasional but unmistakeable râle. The cardiac sounds are particularly clear and distinct. I suspect phthisis, but more than a suspicion is to-day unjustifiable; yet there surely cannot be any inflammation of mucous membrane, of pulmonary tissue, or pleura. His temperature this morning is 98·2, pulse 108, respirations 26; evening temperature 99·4.

February 25th.—Temperature, 97·8; pulse, $\frac{132}{108}$; respiration, 39; sputa of puriform masses floating in a thin fluid. Evening.—Temperature, 98; pulse, $\frac{126}{102}$; respiration, 32.

February 26th.—Temperature, 98·2; pulse, $\frac{118}{96}$; respiration, 34. Evening.—Thermometer broken by accident; pulse, $\frac{120}{104}$; respiration. 36.

February 27th.—Pulse, $\frac{120}{100}$; respiration, 32. Evening,—Pulse, $\frac{118}{104}$; respiration, 36.

February 28th.—Pulse, $\frac{116}{102}$; respiration, 32, Evening.—Pulse, $\frac{120}{100}$; respiration, 36.

February 29th.—Pulse, $\frac{120}{100}$; respiration, 32. Evening.—Pulse, $\frac{118}{102}$; respiration, 32.

March 1st.—Pulse, $\frac{112}{110}$; respiration, 32. Evening.—Pulse, $\frac{116}{100}$; respiration, 32.

March 2nd.—Pulse, $\frac{116}{100}$; respiration, 32. Evening.—Pulse, $\frac{120}{100}$; respiration, 32.

March 3rd.—Pulse, $\frac{120}{102}$; respiration, 34. Evening.—Pulse, $\frac{116}{104}$; respiration, 34.

March 11th.—There is distinctly less motion in the left than in the right side.

March 19th.—Sputa more puriform.

April 1st.—Less cough, less expectoration, râles diminishing, dulness less marked. Temperature, 98·2; pulse, $\frac{120}{112}$; respiration, 26.

April 2nd.—	Temperature,	98·4;	pulse,	122	standing,	112	lying;	respiration,	32.
,, 3rd.—	,,	100·4;	,,	116	,,	108	,,	,,	32.
,, 4th.—	,,	99·2;	,,	122	,,	112	,,	,,	34.
,, 5th.—	,,	99·4;	,,	120	,,	112	,,	,,	32.
,, 6th.—	,,	98;	,,	104	,,	100	,,	,,	32.
,, 7th.—	,,	98·2;	,,	112	,,	110			

Which gives an average for the week of—Temperature, 98·8; pulse, $\frac{114}{103}$; or a difference between standing and lying of only 5, and respiration 31.

April 8th.—	Temperature,	97·8;	pulse,	112	standing,	100	lying;	respiration,	32.
,, 9th.—	,,	99·2;	,,	114	,,	110	,,	,,	34.
,, 10th.—	,,	98·0;	,,	120	,,	116	,,	,,	32.
,, 11th.—	,,	98·0;	,,	114	,,	110	,,	,,	34.
,, 12th.—	,,	98·2;	,,	114	,,	108	,,	,,	32.
,, 13th.—	,,	98·0;	,,	120	,,	114	,,	,,	32.
,, 14th.—	,,	98·2;	,,	118	,,	112	,,	,,	43.

Which gives average for the week of—Temperature, 98·2; pulse, $\frac{116}{110}$; or a difference between standing and lying of only 4, and respiration 32.

April 15th.—	Thermometer,	97·2;	pulse,	116	standing,	110	lying;	respiration,	32.
,, 16th.—	,,	97·6;	,,	120	,,	116	,,	,,	32.
,, 17th.—	,,	98·2;	,,	118	,,	110	,,	,,	34.
,, 18th.—	,,	97·8;	,,	120	,,	116	,,	,,	34.
,, 19th.—	,,	..	,,	..	,,	..	,,	,,	..
,, 20th.—	,,	98·8;	,,	..	,,	..	,,	,,	..
,, 21st.—	,,	98·6;	,,	116	,,	112	,,	,,	32.

Which gives an average for the week of—Temperature, 97·8; pulse, $\frac{114}{113}$; or a difference of only 4 between standing and lying; and respiration, 33.

April 22nd.—	Thermometer,	98·0;	pulse,	120	standing,	114	lying;	respiration,	32.
,, 23rd.—	,,	98·0;	,,	120	,,	116	,,	,,	34.
,, 24th.—	,,	98·2;	,,	118	,,	114	,,	,,	32.
,, 25th.—	,,	98·2;	,,	120	,,	116	,,	,,	32.
,, 26th.—	,,	98·0;	,,	118	,,	114	,,	,,	32.
,, 27th.—	,,	98·0;	,,	118	,,	114	,,	,,	..
,, 28th.—	,,	98·0;	,,	118	,,	114	,,	,,	..

Which gives an average for the week of—Temperature 98; pulse $\frac{116}{113}$; or a difference between standing and lying of only 4, and respiration 32.

April	29th.—	Temperature	94·4 ;	pulse	120	standing,	116	lying ;	respiration	32.
„	30th.—	„	98·6 ;	„	120	„	114	„	„	32.
May	1st.—	„	98·2 ;	„	118	„	112	„	„	32.
„	2nd.—	„	98·4 ;	„	120	„	116	„	„	32.
„	3rd.—	„	99·4 ;	„	120	„	116	„	„	32.
„	4th.—	„	98·8 ;	„	120	„	116	„	„	34.
„	5th.—	„	98·0 ;	„	118	„	114	„	„	32.

Which gives an average for the week of—Temperature 98·5 ; pulse $\frac{118}{115}$; or a difference between standing and lying of only 4, and respiration 32.

May	6th.—	Temperature	..	pulse	..	standing,	..	lying ;	respiration	..
„	7th.—	„	98·6 ;	„	116	„	110	„	„	32.
„	8th.—	„	98·0 ;	„	114	„	110	„	„	32.
„	9th.—	„	98·4 ;	„	120	„	116	„	„	32.
„	10th.—	„	98·8 ;	„	..	„	..	„	„	32.
„	11th.—	„	..	„	..	„	..	„	„	..
„	12th.—	„	100·6 ;	„	120	„	116	„	„	34.

Which gives an average for the week of—Temperature 98·7 ; pulse $\frac{117}{115}$; or a difference of only 4, and respiration 32.

The diagnosis of phthisis having been made some time, he was brought before the half-yearly Invaliding Board, and on its recommendation would have gone home to England, had he not become so much worse before the invalids were sent from Canada. He was now obliged to take altogether to his bed. On the 13th of the month, he was attacked with a violent rigor ; his temperature rose to 104·6°, with a pulse of 124 lying, and respirations 34. Next morning the existence of large cavities was too evident. The sputa became enormously excessive, of a purulent appearance, and the following observations were made :—

May	13th.—	Temperature	102·8 ;	pulse	..	standing,	..	lying ;	respiration	..
„	14th.—	„	99·6 ;	„	..	„	108	„	„	..
„	15th.—	„	100·2 ;	„	..	„	110	„	„	32
„	16th.—	„	99·0 ;	„	..	„	..	„	„	..
„	17th.—	„	100·2 ;	„	..	„	104	„	„	28
„	18th.—	„	99·2 ;	„	..	„	104	„	„	32
„	19th.—	„	98·8 ;	„	..	„	110	„	„	34

Which give an average for the week of—Temperature 100 ; pulse 107 lying, and respiration 31.

On the 14th I made the remark—"The system has temporarily recovered "from the shock, and is becoming tolerant of the diminished available lung "tissue. This tolerance will, however, soon yield to necessity, and the lungs "will soon be incapable of purifying the blood even to the extent required for "his diminished body."

His evening temperature on the 15th was only 99·2°, and on the 18th 99·4°. On the 19th also his evening temperature was 99·4°.

On the 20th, the sputa was frothy and puriform, and very characteristic of phthisis. It is needless to dwell on the physical signs. The intestinal canal performed its functions regularly and healthily. He seems to have no disease whatever but that of the lungs. The following observations were taken :—

May 20th.—Temperature 99·6 ; pulse 120 lying ; respiration 38. Evening.—Temperature 99·4.

May 21st.—Temperature 100·4 ; pulse 108 lying ; respiration 40. Evening.—Temperature 100.

May 22nd.—Temperature 99·2 ; pulse 110 lying ; respiration 36. Evening.—Temperature 100·2.

May 23rd.—Temperature 100·4 ; pulse 120 lying ; respiration 40. Evening.—Temperature 100·8.

May 24th.—Temperature 100·2 ; pulse 120 lying ; respiration 38. Evening.—Temperature 100·2.

May 25th.—Temperature 99·6 ; pulse 124 lying ; respiration 42. Evening.—Temperature 100·2.

May 26th.—Temperature 99·8 ; pulse 120 lying ; respiration 42. Evening.—Temperature 99·6.

May 27th. Died this morning, after—as well as we could judge—an illness of about three months and a-half in length. For the last 10 or 12 days

he has been in a marked state of hectic, cheeks very much flushed, and suffering from profuse sweating and frequent rigors; pulse very small and quick. A few days ago he expectorated a mass of tubercle about the size of a walnut. He has had but one solitary attack of hæmoptysis; never complained much of thoracic tenderness.

Autopsy 30 hours after death. Skin very white and semi-transparent; body rather well nourished, there being a considerable quantity of subcutaneous fat; muscles red and firm; the cavities of both pleuræ almost entirely obliterated by adhesions of great tenacity. I never before removed the lungs from the body with such difficulty. Some portions of their substance I left attached to the thoracic wall. The pleuræ were converted into a muscular looking covering for the lungs, which was about one-eighth of an inch in thickness. This covering appeared to be a fleshy substance, but was in reality a tissue pervaded with tubercle.

Having removed the lungs with as much as possible of their investing morbid membrane, which must effectually have prevented all gliding motion of the viscera, I found them thickly studded with grey miliary tubercles, giving to the cut section a very rough appearance and feel. In the left lung they pervaded every portion of the pulmonary tissue, giving whole square inches of the surface a perfectly grey appearance. Dispersed throughout the lungs there were also masses of yellow tubercle, from the size of a pea to that of a pigeon's egg, and varying from a soft consistence to the hardness almost of cartilage; in fact the apex of the left lung was more like a piece of cartilage than anything else. In the upper lobe of this lung I found a cavity the size of a walnut, and there were besides several anfractuosities. The right lung was about as far advanced in disease in its upper lobe as the left was in its lower, and the lower lobe of the right lung had by far the smallest quantity of deposit, and that of the grey miliary character, without any yellow tubercle; so that if we had placed the apex of the right lung under the base of the left, and made a clean section from top to bottom through both, we should have had a successive gradation of developed disease presented to us. At the top complete replacement of lung tissue by morbid product of the most developed character, resulting in utter destruction of parts; lower down the tissues pervaded by the grey miliary first form, with a good deal of the yellow, lower still (top of right lung), the grey universally pervading with very little yellow; lower still nothing but the grey form, and lower still a few cubic inches of what might be called the available portion of the pulmonary organs. And so with the pleuræ. At the top (upper lobe of left) the lung was so solidly united to the parietes that the knife only could separate it; lower down the fingers could do this, but with great difficulty; lower down (upper lobe of right) this was easier to do, and lower still there was a portion of the pleural cavity existing.

The heart was very fat on the surface, but was otherwise quite healthy; liver and spleen quite normal; no enlargement of the mesenteric glands.

Remarks.—The physical signs and the diagnosis were most satisfactorily verified by the post-mortem examination. It appears to me certain that a miliary deposit had taken place to a very considerable extent when he first presented himself at hospital. Yet at this time his morning and evening temperatures were normal; in fact until the 11th of May his temperature, with remarkably few exceptions, was always normal; but there is one remark to be made here of paramount importance. I am here speaking of his temperature between nine and ten o'clock *every morning. Unless the time of a thermometric observation on a patient is given, apparently conflicting theories will be announced, and endless controversy will be the result.* Temperatures taken before noon are all-important for one reason out of many—viz., that it is in the morning that invaliding boards and consultations generally take place. Observations taken at such times are of value, only in comparison with others taken at the same time of day. I may state, however, that I have taken several normal evening temperatures of phthisical patients.

The pulse in this case was almost invariably over 100 lying, and I believe that the rapidity of the pulse to be more constant in phthisis than the elevation of temperature. A peculiarity (?) in his pulse was the small increase of rate when he stood. This, however, has been stated to be very generally the

case in phthisis. The respirations were almost invariably over 30 lying or standing. With all this, there was I believe no inflammation in the lungs, nor had we evidence of general fever. Why should we necessarily seek for such? I have seen morbid deposit in the penis, and removal of that deposit by ulceration, which destroyed nearly half the organ, where the average temperature of 54 morning and evening observations was 98·4°, 40 of the temperatures being 99° and under, the highest taken being 100·4°, three only exceeding 100°. I have seen syphilitic sarcocele terminating in sloughing, where the average temperature given by 28 observations was, for morning 97·5°, one only exceeding 99°, and for evening 98·3°, two only exceeding 99; and I have, in like manner, seen necrosis of the tibia with extensive subcutaneous infiltration, and a large number of buboes, &c., without any elevation of axillary temperature. I do not mean to say that increased heat is not a strong corroborative evidence of the existence of phthisis. I think it is, but I believe that it is hazardous to assert that because a patient's temperature is not above 99° that he is not phthisical. I think it proved that a considerable deposit of tubercle may, under favourable circumstances, take place in the lungs without giving rise to elevation of temperature; and I may here state my opinion, founded on about 30,000 observations, that the maximum of axillary temperature in a healthy man is 99°.

There are some particular points of interest in the case which I have given, but as they have no bearing on the question of the correlation of temperature, pulse, and respiration, I must pass on to a consideration of the next case, which justifies me in expressing the opinion that tuberculosis may be in progress without causing a diagnostic increase of natural heat.

Corporal T. P., aged 24, service 6 years, was admitted into hospital on the 9th of April, 1867. He had had fever of 11 days' duration in January of the same year. Shortly after his discharge from hospital, he got a cough which troubled him every morning and every evening. It was at first "quite dry," but latterly he expectorated, pretty freely, a "yellowish matter." Within the last month he has had hæmoptysis, but it occurred once only. He appears to be rather a healthy young fellow, but he has decidedly lost flesh. Both his parents died of consumption, and one of his sisters at the age of 19. His skin is soft and delicate. The thoracic movements are not expansile; temperature, 99·4°; pulse, sitting, 92, and standing 100. Percussion gives a shade of dulness over the right infra clavicular region; and here the systolic sound is very audible—more so than in the corresponding opposite region. There is no rough breathing, but the expiratory murmur is prolonged, and is quite equal in length and intensity to the inspiratory. There is, at the end of every forced inspiration, a moist râle in the right lung.

Within ten days I brought this man before an Invaliding Board, the members of which confirmed my diagnosis of phthisis. Nine days after admission, I find the following remark in my case-book:—"The sputa is puriform, dul-"ness marked, and deep inspiration produces sonorous râles."

The first observation gave an elevated temperature, 99·4°; but subsequently I took 23, morning and evening, with the result that it varied from 98° to 98·8°.

On the 2nd of May (23 days after admission) he left Malta for England, and was eventually discharged the Service from Netley Hospital.

Here we have a case in which, for 11 days certainly, a man's temperature was normal. Now if during that time he had been examined by one who believed that elevation of temperature was the constant accompaniment of phthisis, he would have been pronounced free from the disease, whereas he not only had tuberculosis, but some softening of the morbid deposit.

As a further example of the correlation of temperature, pulse, and respiration in phthisis, the following are specimens of a large number of observations made on a woman aged 30, the wife of a soldier in Malta. Her disease extended over a period of 4 years. The observations were made at various times within 18 months of her death.

Temperature, 100·8°; pulse, 116; respiration, 48. Symptoms: great debility, progressive emaciation, dyspnœa, cough, hæmoptysis, anorexia, nausea, vomiting, sputa puriform and nummular, sonorous sibilant, and muco-crepitating râles.

Temperature, 101·6°; pulse, 120; respiration, 44. Symptoms: ditto.

Temperature, 100·6°; pulse, 108; respiration, 42. Extremely weak, stomach very irritable, no hæmoptysis.

Temperature, 100·6°; pulse, 120; respiration, 48.

Temperature, 100·8°; pulse, 112; respiration, 44. Suffers from severe rigors; has occasional pain between the scapulæ.

Temperature, 100°; pulse, 108; respiration, 48.

Temperature, 99·6°; pulse, 100; respiration, 48. Pulse scarcely to be felt; it is so weak and small. Percussion gives, and has always given, an extraordinary clearness of sound, probably due to diminished amount of blood in lungs (Stokes), and in part to the emaciated condition of thoracic parietes (Dr. Clarke).

Temperature, 100°; pulse, 120; respiration, 44.

Temperature, 100·8°; pulse, 120; respiration, 52. Rigors very severe, followed by burning heat of extremities.

Temperature, 98°; pulse, 90; respiration, 48. Wonderful improvement in all her symptoms, which improvement lasted a few months.

Temperature, 99·6°.; pulse, 112; respiration, 44.

Temperature, 100°; pulse, 124; respiration, 40. This last recorded observation was taken about six weeks before death, when she was in very marked hectic, and vomicæ were found in several places in the lungs.

Notwithstanding the acceleration of this woman's pulse and respirations, her temperature never exceeded 102°. This, one might attribute to the very chronic nature of her complaint; but during the same month in which she first asked my advice, I had under my treatment No. 3,479, Private T. K, aged 32, service 15 years, who died of acute tuberculosis in 23 days, in the regimental hospital of the 29th Regiment; and the man's temperature, taken twice daily, never exceeded 102°. In fact, reverting to the case, I find this note made on the 20th April, 1867:—"Until the 12th of the month, or the 10th day of "his disease, his temperature was always normal in the morning, and his "evening temperature never exceeded 101·6°. Since the 13th inst. it has "generally been over 100°, but never rose higher than 101·4°." After death we found both lungs closely studded, in every part, with grey miliary granulations very equally distributed. Anteriorly, both organs were emphysematous, but posteriorly both organs were congested (*post-mortem* 32 hours after death). A few nodules of yellow lardaceous tubercle, from one-fourth to one inch in length and breadth, were found isolated in various parts of the upper lobes. Both pleural cavities were completely obliterated by adhesions which had not the character of recent formation.

In general I have observed that—excepting the times of intercurrent attacks of bronchitis, pneumonia, &c.—the temperature of the patient is not so high as we would expect it to be from the persistent rapidity of the pulse and the respirations. I have taken a temperature of 100°, and a pulse of $\frac{120}{44}$, in a case of phthisis (No. 3,102, Private D. F., 29th March, 1866) of seven months' duration, where there had not ever been any diarrhœa. The observation was taken a fortnight before death. Again, in a case (944, Private D. O., 29th Regiment) which was under my observation for five months before death, the highest temperature I observed was 100·2°, whilst his pulse was 154, and respiration 50.

During the first 23 days that this man was under observation, his average morning temperature was 98°, average evening temperature 99°, and average pulse 100. And herein I find again a confirmation of the opinion which I hold, that tuberculosis may exist without elevation of temperature. At this period of his disease he had had hæmoptysis; his voice was very weak and husky; and the sputa were purulent, but not excessive. His skin was so fair and delicate that a most reasonable assumption from inspection alone, was, that this man was phthisical. This was in June 1866. In July there were small crepitating râles throughout the left lung, and he had a return of the hæmoptysis. In September I find that the emaciation had progressed very much; he was suffering from diarrhœa; that his appetite was bad, and that his temperature ranged from 99·4° to 100·2°; that marked dulness of the left infra-clavicular and mammary regions existed, and that here the râles were larger and more numerous than they were a month ago. The breathing sounds of the right

and posterior left puerile in character. Pulse was now almost invariably over 140, and respiration over 40. On the 27th of the month a cavity was diagnosed towards the acromial end of the infra clavicular left region, gurgling being distinct. On the 28th I find that at 5 P.M. his temperature was 98·8°; and on the 2nd October, temperature, 99°; pulse, $\frac{13}{120}$; respiration, 52; gastric irritation very great. On the 19th, temperature, 98·8°; pulse, 120; and at 5 P.M., temperature, 99·4°. On the 20th, temperature, 98·6°; pulse, 112; respiration, 40. On the 22nd I notice, "His average temperature for the last week "has been 98·5°." He had had severe diarrhœa for some time, and a systolic murmur had become developed. He died on the 23rd, and we made the autopsy 24 hours after death. We found the lungs so adherent to the parietes that both pleural cavities were almost obliterated, especially the left; the adhesions for the most part inextensile, and difficult to break through. The lungs on surface and on section presented innumerable granules of miliary tubercle, closely but separately imbedded in every portion of both organs, excepting a small part of the lower lobes. These granules were prominent, firm, grey in colour, and irregular in shape; the large majority appeared, however, to be round or oval. On section through the apices, a vomica was discovered in each; that in the right was lined by a smooth, apparently pyogenic, membrane; it communicated with several bronchial tubes. In the opposite viscus, the vomica in the apex might have held half an ounce of fluid, bounded superiorly only by the pleura. About an inch below this, and under the acromial end of the infra clavicular region, there existed a large and multilocular cavity; it was not lined by any membrane, but its wall consisted of broken-down lung tissue. Throughout the two upper lobes, very many anfractuosities were seen. The most careful examination failed to detect a single nodule or tubercle exceeding the eighth of an inch in diameter, nor did there seem to be any fatty or calcareous degeneration; even in the apices, the nodules were grey, firm, and separate. Mitral valves were diseased. Small intestines congested, but no loss of substance.

The above was a well-marked case of phthisis of five months' duration, in which the temperature was always low, frequently normal, whilst the pulse and respirations were very much accelerated. And with this case I will conclude my demonstration that, fully recognizing the value of the thermometer to the clinical observer, it must be admitted great care is demanded of us in the interpretation of the information it affords; and that in phthisis especially we must not be carried away with the idea that the thermometer will enable us positively to say, in a doubtful case, whether the patient is suffering from the disease or not. Its positive evidence is of very great value; its negative evidence must be admitted with considerable reservation.

APPENDIX No. X.

INSOLATION, OCCURRING AT NOWSHERA, EAST INDIES, IN 1867 WITH REMARKS.

By Assistant-Surgeon STAPLES, 19th Regiment.

FROM the 21st of June until the 3rd of July, 1867, when there was a shower of rain and a consequent decrease of temperature, the hot winds blew unceasingly at Nowshera. There was no remission of their severity at any time of the twenty-four hours; and, as a rule, the thermometer read higher at night than in the day time.

The highest readings of the thermometer in the hospital verandah were observed about half an hour after sunset, due, no doubt, to the solar radiation from the brick building, in addition to the hot wind.

The average temperature in the wards and verandah, for the period mentioned, is shown in the following Table:—

	Hospital Wards.				Hospital Verandah.			
	Sunrise.	10 A.M.	3 P.M.	10 P.M.	Sunrise.	10 A.M.	3 P.M.	10 P.M.
Average temperature from 24th of June to 3rd of July	95	97·32	98·02	97·7	95·92	102·59	107·41	98·08
Average from the 27th to the 30th of June inclusive	99·22	99·5	99·62	102·75	98·75	105·25	111·25	105·7

The heat was unbearable, and told very much on both officers and men. All were in a state of nervous exhaustion, and those who never felt any bad effects from previous hot seasons were doubtful whether their constitutional powers would carry them through this trying period.

The condition of the troops may be described as gasping for breath; there was a peculiar feeling of weight on the chest, even in the apparently healthy; and after every twenty inspirations, or thereabouts, a strong and convulsive effort was necessary to inflate the lungs. Nobody in the regiment had ever experienced such insufferable heat before; and this opinion was shared in by the Native camp followers, numbers of whom fell victims to its effects.

The injurious influence of this prolonged high temperature was not confined to human beings. In two instances I have seen dogs drop dead after slight exertion; and I have been informed, on reliable authority, that the number of dead "dâk" (posting) horses between this station and Fort Attock, on the Indus, was remarkable.

During the above-mentioned period, being from the 21st of June to the 3rd of July, all ranks of the 19th Regiment suffered severely from insolation, and from the premonitory symptoms of that disease. Cases admitted into hospital with the latter symptoms were returned under the head of fever, because the nomenclature does not provide for their classification, and probably because they had dry and burning skins; but that they were not cases of the essential disease—fever—I feel convinced, firstly, because no crisis, as the term is applied to fevers, was observed in their progress; secondly, because in the great

majority of them there was a decrease in the number of pulse-beats; and lastly, when the cause, viz., prolonged high temperature, was removed, an almost instantaneous return to health was the result.

I would wish to call particular attention to the latter statement, as a very striking illustration of it occurred during the progress of the disease here,—namely, on the 30th of June, between 5 and 10 P.M. when the heat may be said to have reached its greatest point of intensity, no less than 28 men were brought to hospital with what I have called premonitory symptoms of insolation; and so intense were their sufferings that the most sanguine could not have hoped for anything better than a large proportion of attacks of the graver disease. However, at about half-past 10 o'clock, a severe land-storm came on, which had the effect of reducing the temperature from 105° to 95° Fahr. in the wards, and at 12 P.M. the whole of these men were in a fit state to be discharged hospital.

Condition, class, rank, or previous habits appeared to exert no influence over the distribution of attacks, as officers, non-commissioned officers, and men suffered in as nearly as possible the same proportion, and the abstemious enjoyed no greater immunity than the intemperate.

The men who were attacked in the first three or four instances were remarkable for their robust constitutions and muscular development, but afterwards the more weakly became the subjects of the disease.

No case occurred amongst the notoriously intemperate, or those who had been previously in hospital for delirium tremens or ebriositas; while one occurred in a man of the most remarkab y abstemious habits, an officer of the regiment.

The attacks, with the exception of the last-mentioned case, and that of one private, occurred in the regimental hospital amongst the patients suffering from premonitory symptoms; and in no instance was a man in good health, and who had not been previously complaining, suddenly struck down.

The attacks, generally speaking, happened between bedtime and 12 P.M.; but this rule did not hold good in every instance, as a few cases occurred in the afternoon.

Several cases of men fainting on sentry, at funeral, and other fatiguing duties, were brought to hospital during the progress of the disease; but as they seldom required more than a dash of cold water over the chest and head to revive them, great care was taken not to include them amongst the cases described as insolation, or amongst those who suffered from the premonitory symptoms of that disease.

Symptoms of the Disease.

As I believe there is no difference in the pathological course of what has been called premonitory symptoms of insolation and insolation itself, and that one is only an aggravated form of the other, I shall describe the symptoms of both as indicative of different stages of the same disease.

That both are due to the same cause, viz., prolonged high temperature, I think there can be no doubt; and the only line of demarcation between them seems to me to be the occurrence of insensibility attended with convulsions, or, as the case may be, in the graver form of the disease.

The first symptom complained of was obstinate constipation. It was not unusual for men to go six or seven days without a fœcal evacuation, and then only by means of aperient medicine. The stools passed, even by those in apparent health, consisted of hard dry lumps of a blackish colour.

This condition of extreme costiveness appeared to depend not upon a want of the hepatic secretion, but upon an absorption or drying up of the natural mucoid secretion of the colon, and perhaps also upon a want of tone in the muscular coat of the rectum, and consequent inability to expel its contents.

When this condition had existed for a few days, patients generally began to complain of nausea, loss of appetite, and muscular prostration.

Headache of a severe character followed; the pain was generally referred to the temples and back of the head; and in cases where I have asked patients to conduct my finger to its exact seat, they pointed out the transverse

ridges which extend outwards from the occipital protuberance to the mastoid processes of the temporal bone.

Perhaps the explanation of this was accounted for in the intensely distended state of the transverse sinuses of the dura mater in fatal cases.

Giddiness in the head, with loss of sleep, were generally the next symptoms. The latter was the most distressing of all to the patients, and in some of the cases its prolonged intensity was very remarkable.

The patients had all the desire to sleep, and were constantly composing themselves to do so, but they seldom succeeded. At one time they would become restless, and toss their arms and legs about in the wildest manner; while at other times, from an apparent doze, they used to jump up with the most scared expression of face, and, on being questioned, would tell either of nightmare or some horrid dream.

This continuous loss of sleep was very difficult to manage, as the exhibition of opiates was considered too dangerous an experiment.

The next symptom in the order of succession was the burning skin, and this I believe may be looked upon as the true premonitory sign of the disease. The skin felt roughened, as if particles of hot sand had been sprinkled over it; and when the open hand was placed upon the chest of a patient suffering from this symptom, a peculiar sensation of creeping was imparted to it.

This condition of the skin formed, as I will hereafter endeavour to show, the *principal guide* to the treatment of cases suffering from the premonitory symptoms of insolation.

Visible pulsation of the vessels at the root of the neck was a very common symptom, and in a few cases the same condition was observed in the abdominal aorta.

In one case, viz., Private S. of the Band, the aorta pulsated violently; and the patient used to complain of it as a "fluttering of his stomach."

Spasmodic contractions of the muscles of the extremities were observed in three cases; and in that of Private M., officers' mess-waiter, they were of such an intense character that the orderlies could only with difficulty be convinced that the patient was not the subject of choleraic cramps.

None of the cases in which this symptom was observed became the subject of insolation proper.

Frequency of micturition was observed in one solitary instance amongst the numbers who suffered from premonitory symptoms, and it was not present in any of the cases of insolation proper.

I watched anxiously for this symptom on account of the importance attached to its presence as a diagnostic mark of the disease, and asked every patient whether he had passed water frequently; but, with the above exception, the answer was always in the negative. As it was not present in any of the cases of insolation proper, and in only one out of 47 cases of those suffering from premonitory symptoms, I attribute no importance to its occurrence as a pathognomonic sign of the disease, and feel inclined to look upon it as vicarious of the suppressed action of the skin.

The state of the circulation, as indicated by the pulse at the wrist, was variable. In a few cases it was quick, strong, and thready, while in the great majority it was slow and laboured, and the radial artery felt as if carrying a larger volume of blood than usual.

In one case, which afterwards proved fatal, the pulse counted only 46 beats per minute during the premonitory stage of the disease.

This condition of the pulse is at variance with the experience of most observers, and for that reason I took every opportunity of pointing it out to my colleague, Assistant-Surgeon Hanrahan, who can bear me out in my remarks.

When a patient who had been suffering from some or all of the foregoing symptoms became insensible, or, more correctly speaking, became the subject of insolation, the symptoms, although preserving a marked similarity, were by no means regular or uniform; and for this reason I propose giving them as manifested in two of my fatal cases.

Case 1. Private W. H., age 24 years, service 7½ years, in India 8 months, a previously healthy man, a patient in hospital with premonitory symptoms, was seized with insolation at 9 P.M., June 24, 1867, and died at 10 P.M. He was perfectly insensible throughout the attack; but, as is not usually the case, the

body generally was spasmodically convulsed. The power of swallowing was lost from the beginning of the attack till its termination. The respiration was extremely rapid, and appeared to be carried on solely by the diaphragm, as there was no movement whatever of the chest walls. Frothy serum of a reddish colour was emitted from the mouth, and death was apparently the result of this substance blocking up the air passages. The patient's body felt burning to the touch, both before and during the attack, and also for about ten hours after death.

Case 2. Private T. S., age 32 years, service 12½ years, of which 9 years and 7 months in India.

June 27, 1867. A strong muscular man of temperate habits, who was employed as a blacksmith in the armourer's shop, came to hospital this morning complaining of giddiness in the head, and constipation. He said he had not slept for several nights on account of the severe heat. It may be mentioned here that the thermometer, for the last 7 days, has seldom been below 98° Fahr. in the most carefully kept room.

The patient was ordered a dose of the hospital aperient mixture, and to have the cold douche every second hour during the day.

June 30. The aperient produced two scanty and scybalous stools, black in colour, and of a most offensive smell. His skin is still dry and burning to the touch; that of the head and chest more so than that of the extremities. His pulse is apparently normal in beat (80); more easily compressed perhaps than it ought to be. He says "his head feels too full," and he complains of a fixed pain in the back of the head, internal to the occipital process. Ordered to have 12 leeches applied behind each ear, and to have an ounce of diaphoretic mixture every second hour, and the cold douche over the surface of the body whenever the skin becomes intensely hot; beef-tea, limejuice *ad libitum*.

July 1, 1867. Complains this morning, in addition to the symptoms of yesterday, of difficulty of breathing. He says his chest feels as if there was "a cord tied round the bottom of it." Complains also of costiveness, and the colon feels as if full of fæces. He was ordered a pill at once, of a grain of podophylia and two grains of extract of hyoseyami. The cold douche to be repeated every time the skin got intolerably hot. The diaphoretic mixture to be continued. Beef-tea; lime-juice.

July 2. There was no change in this patient's symptoms until four this morning, when, after a very restless night, he became suddenly insensible.

At the moment of attack he presented the following symptoms:—An intensely burning heat of skin; a low and compressible pulse (76); pupils contracted; insensibility of lids (the latter lay in wrinkled folds over the eyeballs); dryness and congestion of the conjunctival mucous membrane. He had the power of swallowing, and the body remained in a state of complete immobility. The breathing was hurried, and apparently carried on by the action of the diaphragm.

Directly he was attacked he was placed under the douche, and the latter was continued until the skin became cool. He also had a purgative enema, which brought away a large quantity of fæces, at first of a dark and tar-like colour, but afterwards the character of the dejection underwent a change, and immense quantities of what looked like muco-purulent matter were voided, apparently by spasmodic action of the colon.

When he had been about an hour under the douche, the skin was reduced to the natural temperature, and the pulse was observed to be a little fuller in volume. He was then placed upon a dry bed, and 12 leeches applied to each temple; and he was given a stimulant draught every half-hour. Arrowroot and port wine at intervals were also administered.

July 2, 8 A.M.—Still completely insensible. In fact there is no change whatever since he was attacked, except that the skin has again become burning hot. Ordered to have the cold douche repeated for about 15 minutes, also some arrowroot and port wine.

Vespere.—Still in complete coma; respiration semi-stertorous, and more hurried than at morning visit; pulse weaker. He was ordered to have a blister applied to the occiput; the blistered surface to be dressed with dilute mercurial ointment. Ice was kept constantly applied to the forehead, and the stimulant draughts were given as before.

He remained in the same comatose state till 11 P.M., when, after a few hurried respirations, he died. For about an hour previous to his death, frothy mucus, tinged with blood, was emitted from the mouth; and it was quite apparent to myself and attendants in the hospital that the body had a strong cadaverous odour for at least two hours before the patient died.

In contrasting the foregoing cases, it will be seen that in the first the patient had strong convulsions from the time of seizure until death; whereas there was a complete absence of this symptom in the second and in all the other cases that occurred at Nowshera.

The nature of the convulsive movements was remarkable. The patient appeared like one in a fit of epilepsy, but the convulsions were not strictly epileptiform. The body was in a state of rigor, and kept moving or rather jumping from side to side, making fulcra of the heels, buttocks, and occiput. The patient died strongly convulsed.

In all cases of the disease, insensibility was complete; and the patients, with one exception, continued unconscious until they either died or recovered. In the case alluded to there was a temporary return of consciousness, during which the patient recognised his attendants and answered a few questions I put to him, rationally; but he again relapsed into insensibility and died.

During this man's temporary recovery the expression of his features was painful to look at. I feel quite unable to describe accurately their appearance, but suffice it to say they were indicative of extreme terror.

During the comatose stage of the disease, the eyeballs remained perfectly fixed, and in most cases they inclined upwards; the pupils were contracted, but not to an extreme degree; the orbicularis muscle was paralysed, and the lids moved according to the laws of gravity, *i.e.*, if the lids were closed over the globe, the lower would slowly fall downwards, while the upper would remain covering half the eyeball.

The breathing was always rapid and semi-stertorous, and unaccompanied by any movement of the chest walls. The ribs and sternum were in a state of complete immobility, and respiration appeared to be carried on solely by the diaphragm.

Towards the close of all fatal cases, frothy mucus of a reddish tinge was discharged from the mouth. This symptom, I believe, may be looked upon as a fatal prognostic during an attack of insolation. It shows that the functions of the lungs are suspended from excessive venous engorgement; and from my experience I look upon its occurrence as the commencement of the process of death, which in the end is generally by asphyxia.

Post-mortem Appearances.

The *post-mortem* examinations gave the same results in all the fatal cases. The body generally was discoloured from extravasated blood; and this appearance was most marked in dependent positions, such as the back of the neck, posterior part of chest, buttocks, calves of the legs, &c.

A great quantity of fluid blood was found under the occipital portion of the scalp, the result also of *post-mortem* gravitation. The cerebral sinuses were always found full of blood fluid, and of a blackish colour; and on one occasion, when the transverse sinus was cut through, as much as six ounces escaped. Serous effusion always existed beneath the arachnoid, and the veins of the pia mater were in the same state of distension as those of the dura mater.

On further dissecting the brain, serum was found in unusually large quantities in the ventricles and sulci of the convolutions; and a section of the hemispheres always showed a great number of red points.

When the tentorium was divided and the brain removed, serum was always found at the base; and the spinal cord in all cases appeared surrounded by serum.

The left side of the heart was empty, and in no case was a clot found; whereas the right side was always full of fluid blackish blood, and the same condition obtained in the venæ cavæ and vessels forming the roots of the lungs.

The anterior portion of both lungs presented a pale appearance, while the posterior portion was black in colour, from excessive venous engorgement.

This difference in appearance between the anterior and posterior portions of the lungs was well defined by what might be called a line of demarcation, and was due apparently to *post-mortem* gravitation of the disorganised blood.

When a section of the lungs was made, the blood might be described as pouring out, so excessive was the congestion; and the whole of the bronchi and trachea were full of frothy brownish-coloured serum.

The solid viscera of the abdomen were always congested.

The blood was found fluid after death in many instances; but it appeared to me that this condition of the blood had no connection with the pathological cause of the disease, but was dependent upon some *post-mortem* chemical changes, most probably rapid decomposition, as, in the cases of Privates M. and S., blood taken from the nape of the neck, half an hour before death, underwent the normal process of clotting. The view I took of the pathology of this disease was as follows:—

In the first place we have, as the result of prolonged high temperature, a totally suppressed action of the skin, and consequently a retention within the system of the effete material of the blood. These conditions soon give rise to congestion of the principal internal organs, and this again, to a gradually increasing failure of the circulation, with death either from cerebral pressure or from pulmonary engorgement, or, as is generally the case, from a combination of both conditions.

The symptoms of the disease appear to be due to pressure within the cranial cavity: thus the premonitory symptoms, such as giddiness, loss of sleep, violent headache, &c., would depend upon a minor degree of pressure, such as would result from cerebral congestion; whereas the more grave symptoms, which characterise insolation proper, are due to a degree of pressure not consistent with conscious sensibility, or, in other words, to serous effusion.

In support of this explanation, I would add that the pulmonary complication was secondary to the cerebral in all the cases which occurred at Nowshera, and appeared to depend upon a still more increasing serous effusion, complicating the medulla oblongata and origin of the pneumogastric nerve; and I believe the loss of the power of swallowing, which often times complicates cases of this disease, may be explained in the same way.

In cases where congestion of the lungs is not found at *post-mortem* examinations, death would appear to result from direct cerebral pressure before time is allowed to develope the train of symptoms which characterise the pulmonary complication.

Treatment.

In the management of the disease at Nowshera, the greatest care was bestowed upon patients suffering from premonitory symptoms, with a view towords preventing an attack of the graver malady.

Khus-khus tatties and thermantidotes were in constant use, and a double establishment of servants entertained to work them.

During the day time, however, little benefit could be derived from their application, as the whole of the barracks and hospital buildings at Nowshera are built at right angles to the prevailing direction of the hot winds.

At night, when the hot winds blew with even greater force than in the day time, the following plan of working the tatties was found to answer very well:—

The whole of the tatties were placed side by side, in a line across the hospital compound, with a slight convexity towards the direction of the hot winds, while in the concavity the patients lay on their cots.

They thus derived all the benefit of the wind cooled by the *khus-khus* tatties, and patients who had not slept for several nights in the wards often enjoyed a comparatively comfortable rest.

Every ward in the hospital was placed under the care of European orderlies, and the patients were visited as often as possible.

Particular symptoms, such as constipation, giddiness, headache, &c., were treated according to prescribed rules; but whenever a patient's skin assumed the dry and burning feel described in the first part of this Report, he was at once taken outside and placed under the cold douche.

The mode in which this is generally given in India is from a bheesty's mussuck or water-skin; but as I found the latter plan very inefficient, I adopted the following means for giving the douche bath, viz.:—

A stand seven feet high was erected in the hospital verandah, and on this was placed a tub capable of holding about 27 gallons of water. Into the side of the tub, near the bottom, a tin tube, 14 inches long and three-fourths of an inch in diameter, was fixed, having for a stopper an ordinary piece of cork. The tub was kept constantly full by the hospital water-carriers, who reached it by means of a set of steps, and a bed placed under the tin tube for patients about to receive a bath completed the apparatus.

The effect of the douche given in this way was admirable. The patient's skin became rapidly cool, the breathing more tranquil, the pulse firmer to the touch, and the sufferers were in the habit of describing themselves as feeling "very comfortable."

Of course this mitigation of the symptoms did not last long; but as often as a patient's skin became hot and burning, so often was he placed under the douche, and from this treatment I have every reason to believe the happiest results were obtained, as several patients who looked as if nothing could prevent their having an attack of insolation were tided over until the weather became cool, and the tendency to heat apoplexy no longer existed.

Various diaphoretics were given, with a view towards establishing the secretion of the skin; but I cannot say any benefit was derived from their use, while good results were apparently obtained from the diuretic action of nitrate of potass.

Stimulants, such as aromatic spirit of ammonia, chloric ether, brandy and soda water, were prescribed towards the close of the outbreak; and I believe more good resulted from their administration than from all other internal remedies.

They appeared to act at once upon the flagging circulation; and if I should again have to treat this disease in the premonitory stage, I would place the greatest reliance upon the moderate use of stimulants as an adjunct to the douche system.

In the 19th Regimental Hospital, 47 cases were treated according to the foregoing plan, with the following results, viz.:—40 recovered, and 7 became the subjects of insolation. Of the latter, 3 died and 4 recovered.

The remaining two cases of insolation which occurred at Nowshera were not treated for premonitory symptoms.

For the treatment of the insensible or secondary stage of the disease, I have nothing here to add. Those cases which recovered did so apparently from the continued action of the douche, while stimulant enemata, sinapisms to the legs, leeches to the temples, dry cupping the chest, &c., appeared to me to exert no influence over the progress of a case.

APPENDIX No. XI.

INSOLATION, OCCURRING ON BOARD THE ABYSSINIAN HOSPITAL SHIP "GOLDEN FLEECE," WITH REMARKS.

By Staff-Surgeon Roch, in Medical Charge.

From the 12th May to the 4th June, 1868, seven cases of the above disease are recorded as having been treated on board this ship. The first, that of Private J. Y., 26th Regiment, admitted from the Camp Zoulla, on the morning of the 12th May, in a state of insensibility, proved fatal in six hours. The remaining six occurred on board this hospital-ship as a secondary disease invading a constitution debilitated from whatever cause. In some cases, the patients were convalescents from dysentery and diarrhœa, in others, from fever and delirium tremens. To contract this disease it did not necessarily follow that the subject of it should have been exposed to the direct influence of the rays of the sun, as some of the cases occurred in men confined to bed; in others (that of Serjeant S., Army Hospital Corps) the man had been fatigued by duty on shore, and was confined to bed under treatment for slight fever, when he was attacked and carried off by the secondary affection. In my opinion, the disease depends more upon a stagnant state of the atmosphere than upon the actual increased temperature, as no case occurred where there was a draught of air, as in the cook-house—thermometer 130° to 150°, or amongst the firemen in the engine-room—thermometer 130°; while they took place on the lower-after hospital deck—thermometer 82° to 90°. The accession of the disease was marked by the same symptoms in each case, varying only in intensity, and occurred at any period of the 24 hours, sometimes in the morning, at noon, and at night.

The patients, when attacked, were generally lying down in their cots, and complained of heat and pain of the head, restlessness followed by subsultus tendinum, which increased to muscular spasms, convulsions, frothing at the mouth, involuntary discharge from bowels and bladder; the pupils became contracted to a point, and the temperature of the body increased to a most unprecedented degree, transmitting to the hand placed on the brow, surface of the body, or in the axilla, a peculiar burning thrill.

In one case, for example, that of Private W., 45th Regiment, attacked on the 26th May, and who expired in four hours, the thermometer (Fahr.) placed in the axilla, quickly registered 113°, and was still rising when the struggles of the patient obliged me to remove the instrument. I look upon this last as the most characteristic symptom of the disease; stertorous breathing supervenes, with, sometimes, paralysis either of one or both sides. There is great difficulty in administering medicine, &c., by the mouth, as there appears to be a spasm of the muscles of deglutition from an early stage of the disease. The violence of this fit may subside for a time, but only to be succeeded by a second or third, when the patient generally sinks exhausted.

In five of the seven foregoing cases the treatment consisted of the cold douche bath, the application of ice to the head and spine, mustard to the lower extremities, stimulating enemata, the hot hip-bath, and iced water dashed over the head, &c.

The result of this treatment was not satisfactory, the patients having all expired, as shown below, at intervals varying from 40 minutes to six hours.

Regiment.	Rank and Name.	Convalescent from	Attacked by Insolation.	Duration of disease.
26th Foot	Private J. Y.	Admitted from the shore, insensible.	1868. May 12th.	6 hours.
45th „	„ E. W.	Delirium tremens..	„ 26th.	4 „
Army Hospital Corps	Serjeant W. S.	Feb. cont.. ..	„ 27th.	3½ hours.
11th Hussars ..	Corporal H. C.	Dysenteria chronica	„ 27th.	40 minutes.
26th Foot	Private R. H.	„ acuta ..	„ 28th.	2½ hours.

I therefore determined to try the effect of early and free blood-letting, and did so in the cases of two, with the following results :—

Private W. G., of the 45th Regiment a convalescent from diarrhœa, attacked with heat apoplexy on the 28th May, and, while in a state of convulsions, was bled from the temporal artery to 13 oz., until an impression was made on the pulse and the pupils became dilated.

The patient recovered consciousness, but could not articulate, and swallowed with difficulty, from the spasm before alluded to, and paralysis, first of one, then of both sides. He had a relapse of the fit in six hours, and expired in 16 from the time of operation.

Private A., Royal Engineers, a convalescent from diarrhœa, was attacked with heat apoplexy a little before 3 P.M. on the 4th June; at 3 P.M. he was bled from both temporal arteries and from the left arm to 23 oz., the patient being at the time in a fit, insensible, with pupils contracted to a point, and having all the symptoms before alluded to present.

The temperature and pulse fell during the operation, and the patient rallied sufficiently to warrant a hope of his ultimate recovery. He, however, expired the following day at 3.45 P.M., an interval of nearly twenty-five hours from the period of his having been bled. I therefore consider this treatment, where it can be performed at once on the accession of the attack, as deserving further trial.

The average range of the thermometer from the 12th to the 31st May, the period when most of these cases occurred, was at 8 A.M., 88·50° ; at noon, 90·50°; and from the 1st to the 4th June, at 8 A.M., 90·2° ; at noon, 91·8° ; the weather being sultry and atmosphere stagnant.

The foregoing observations were made and written by me before I had read Dr. Aitkin's valuable collection of statistics on this fatal, though highly interesting, disease, and it is gratifying to find one's own ideas and impressions, formed on the limited number of cases that came under my notice, corroborated on such high testimony.

The fact of the stagnant condition of the atmosphere having been the exciting cause in the cases that occurred on board the "Golden Fleece" from the 26th to the 28th May, is sufficiently proved by the fact that the disease disappeared on the vessel being sent to sea on the 29th, at my suggestion, in order to create circulation of air through the hospital decks, and no case occurred until three days after our return on the 31st, though the range of the thermometer did not diminish while we were at sea, having averaged for those three days—at 8 A.M., 88·5° ; at noon, 90·5° ; there being, however, an artificial current of air produced by the motion of the ship through an otherwise stagnant atmosphere.

The following symptoms I do not find mentioned in former notice of this disease, viz. :—

1. The involuntary discharge from bowels and bladder.
2. The spasm of muscles of deglutition, aggravated by attempts at swallowing.
3. And the exact temperature to which the body rises, viz., from 113° to 115° (Fahr.).

It was greatly to be regretted that circumstances did not permit a *post-mortem* examination in the cases alluded to ; but I hesitate not to say that the improvement in the symptoms noted by me as following abstraction of blood, was due to the relief of the congested condition of the lungs mentioned as occurring in this disease by Dr. Parkes, and which I am of opinion characterized the cases that occurred in Annesley Bay.

APPENDIX No. XII.

CHOLERA ENQUIRY, INDIA.

FIRST Report from Drs. Lewis and Cunningham (no date) addressed to Dr. Ross, Inspector-General of Hospitals, Her Majesty's Indian Medical Service, forwarded with Despatch from Government of India, dated 20th September, No. 325, of 1869, and referred to Army Sanitary Commission by letter from India Office dated 29th October, 1869.

Sir,

In accordance with the instructions conveyed in the Orders of the Government of India in the Military Department, No. 88, and dated the 2nd of February, we have the honour to forward a Report of our proceedings since arriving in Calcutta.

1. On the 15th February, 1869, we were summoned to attend a meeting of the heads of the Medical and Sanitary Departments, convened for the purpose of deciding on the best course to be pursued in initiating our work. The resolutions then come to were that the first point to be investigated should be the German fungoid theory of the origin of cholera; but, at the same time, steps should be taken to initiate observations on Pettenhofer's theory of the association of the disease with conditions of soil.

II. Before any investigations as to the fungoid origin of cholera could be entered upon, it was necessary that a laboratory should be procured and fitted with the requisite apparatus. A room having been found at the Presidency General Hospital, steps were at once taken to get it into working order.

III. Owing however to the delay involved in procuring the necessary apparatus, it was not until the last week of April that any systematic series of observations could be undertaken. Since that date a continuous series of both physical and microscopical examinations has been in progress. These observations have mainly consisted—

1. In a careful comparative examination of *fresh* choleraic and healthy evacuations.

2. Observations on the changes occurring in both during decomposition under various circumstances.

3. Cultivation experiments in which the forms of animal and vegetable life developed in cholera evacuations have been compared with those developed in healthy evacuations under similar circumstances.

4. Examinations of fungi, &c., occurring on other substances, with a view to note if any distinct form were confined to choleraic materials.

5. Observations on the comparative influences exerted by choleraic and healthy materials, on tank water, &c., under various circumstances.

6. Examinations of tank water microscopically.

7. Experiments on the effects of cholera evacuations on rice plants.

On the above points careful examinations have been, and are still being made, and the results carefully registered with camera lucida drawings, showing all the forms which have been found and the changes which have been observed to take place in them.

IV. Fungi no doubt have appeared on cholerized materials, but as yet the result of the observations has been decidedly opposed to the theory of Hallier; for in the first place no special fungus has appeared on choleraic matters which has not also appeared abundantly in other media. Secondly, various species have occurred, those very species being most abundant which have been most commonly met with at the same time in other situations. In the third place, the forms most commonly occurring (almost universally) have not belonged to the "cholera series" of Hallier. Fourthly, in no case have cysts, going through the changes which he describes, been observed.

V. The examinations of fungoid forms supposed to be peculiar to rice

plants have as yet been too imperfect to allow of any definite conclusions being drawn from them.

VI. So far as our investigations have gone it would appear that choleraic matter, when mixed with tank water and other media, has a far greater influence in promoting the development of low forms of life than healthy feculent matter. The general results of the whole series of experiments have indeed tended to prove that cholerized material furnishes a nidus peculiarly favourable to low forms of life, but it has yet to be seen that there is any form peculiar to it.

VII. As yet it would be premature to draw any decided conclusion for or against the fungoid theory, for the difficulties besetting any series of observations on a point of this nature are so manifold, and the sources of fallacy so frequent, that every experiment and each step in it must be frequently repeated and verified before the conclusions derived from it can be accepted.

VIII. With regard to Pettenhofer's theory a regular series of observations and registrations of subsoil water-levels has been instituted in various places, both in Calcutta and the neighbourhood. The metereological Reporter to the Government of Bengal has arranged that observations on subsoil water-level, and soil temperature shall be taken at various stations in Bengal; and the Sanitary Commissioner for Oudh has undertaken to establish similar observations in that province in four jails selected on account of their respective liability to and exemption from cholera.

IX. It will be observed that we have as yet no definite opinions to offer regarding the important questions in the investigations of which we have been engaged. With a more extended series of experiments we hope soon to be in a position to state conclusively whether there is any ground for believing in the two theories which have been the subject of our special enquiry; but as the period during which our work has been actually carried on has been short we desire for the present to avoid making any statements which might require correction or modification, on a more complete acquaintance with the subject.

X. In conclusion, we have gratefully to acknowledge the ready aid which we have received from all quarters in instituting these preliminary enquiries.

We have, &c.,

(Signed) T. Richards Lewis, M.B.,
Staff Assistant-Surgeon.
D. Douglas Cunningham,
Assistant-Surgeon, Bengal Medical Establishment.

APPENDIX No. XIII.

OBSERVATIONS ON THE INFLUENCE OF EPIDEMICS OF FEVER IN CHECKING THE ADVANCE OF THOSE OF CHOLERA.

By ROBERT LAWSON, Inspector-General of Hospitals.

THOUGH much has been said and written in support of different opinions as to the means by which epidemics of cholera were diffused, comparatively little attention has been paid to the courses these pursued, or to the causes which seem to have influenced their progress from time to time, and to have ultimately turned each into the particular track which it followed. It is obvious that, as the acquaintance with the natural history of the disease increases, the application of the theories so eagerly supported at present by many epidemiologists will be narrowed more and more, and a point will ultimately be reached where, with a knowledge of causes as yet little heeded, rational explanations may be given of much that now seems unaccountable. The object of this communication is to contribute to the attainment of so desirable an end, by directing attention to a characteristic feature in the relations of fever to cholera.

While investigating the course of pandemic waves, I became aware of the influence epidemics of fever exercise in checking the advance of those of cholera, and *vice versâ*. Fever has frequently prevailed over an extensive area, and though cholera, also embracing a large area, approached the other, yet, while the fever continued, epidemic cholera, as an epidemic, has never penetrated the fever field. Sporadic cases of cholera have frequently been met with a long way within the boundary of the fever field, and similarly cases of fever within that of cholera, but still the fact remains that, though the fever and cholera fields approached each other, neither disease took the place of the other until its force as an epidemic was broken. This fact sanctions the inference that the conditions which generate fever epidemics are not only different from those which produce epidemics of cholera, but are also incompatible with them; and further, that sometimes the one set of conditions, sometimes the other, exists over a large area of the earth's surface, and that the one will give way to the other without any marked change in the habits or circumstances of the population these areas embrace. The importance, therefore, of rightly estimating the influence exercised by one of these diseases over the diffusion of the other is obvious.

In the following relation, I have given, briefly, the course of cholera epidemics from India northwards, from 1818, and have placed in a parallel column the epidemics of febrile disease which were met with in their vicinity about the same time. The information available on these points is but too often fragmentary and incomplete, and does not show in all cases the close limitation of the cholera fields by those occupied by fever, but, as far as the evidence goes, it bears out the general fact in every instance, that where fever prevailed there cholera did not penetrate. In particularising the various epidemics mentioned below, I have employed the principles detailed in the Papers on Pandemic Waves in the Sanitary Reports for the Army for 1864 and 1866, and refer the reader to the map accompanying the latter communication for further information thereon :—

In 1817, 1819, and 1821, fever was particularly severe in Cutch and Guzerat, and northwards towards Rajpootana; it was frequent also in the intermediate years. There was

In 1818, a cholerific wave passed the isoclinal, 30° N., and there was a severe epidemic of cholera in Northern India, which continued into 1819, but it did not extend across, or even

much fever in the Mediterranean stations in 1818 and 1819, plague in the former year in Morocco, and in the latter at Constantinople. Whether Persia and Asia Minor were embraced in this influence, which was manifest at Cutch to the south-east, and Constantinople to the north-west, I have no evidence; but as the febrific influence was then strongly developed throughout the Mediterranean, it most likely embraced the countries between these points as well. Be that as it may, however, epidemic cholera failed to penetrate this district.

In 1820 and 1821, fever was still prevalent in Cutch and Guzerat. In 1821, it was very severe among the troops in Ionian Islands, and continued in the western part of Mediterranean, but I have no notice of its prevalence in Egypt, Syria, or Asia Minor. In 1822, there was a great increase of fever among the troops at Malta. In the Ionian Islands fever was less severe than in 1821, but still high.

In 1823, the causes of fever were not active at either Gibraltar or Malta, but in the Ionian Islands the deaths from it among the troops were 40 per cent. higher than in 1822, the first indication in this neighbourhood of a severe and extensive outbreak of febrile disease, met with this year at Sierra Leone and Ascension, and which, in 1824, was manifested in greatly augmented ratios of mortality from fever at Gibraltar and Malta, by very severe plague in Egypt, plague in the Morea, Monte Negro, at Constantinople and Erzeroum; thus completely encircling the district in which epidemic cholera had shown itself, though the milder forms were still experienced far beyond it.

In 1826, there was a considerable increase in the mortality from fever among the troops in the Ionian Islands, which became still higher in the following year. In 1826, plague was severe at Constantinople, and in 1827 had included Odessa in its

so far as the Indus, in either year. In 1819 this wave would pass the iscoclinal 53° N.; there is no further information, however, regarding the prevalence of cholera in its epidemic form; but in the Mediterranean military stations, in 1819, and more especially in 1820, there were indications of its influence in the form of common, or sporadic cholera.

In 1820, another cholerific wave passed the isoclinal, 30° N., and the disease, in its epidemic form, prevailed extensively in Northern India in China, and passed the Indus into Beloochistan. It continued very active in Northern India in 1821, and spread along the Persian Gulf, and through Persia, as far as Yezd and Bagdad, or to about 34° N. In 1822 the epidemic resumed its activity, and extended to Diarbekir in lat. 38°, and approached the Mediterranean as far as Aintab and Aleppo. This wave would pass the isoclinal 53° N., in 1821, but, although cholera did not become epidemic anywhere in the zone to the north of it, this or the following year, the cholerific influence was still very manifest in the Mediterranean military stations.

In 1822, another cholerific wave entered the zone between the isoclinals 30° and 50° N. This year the epidemic was not quite so active in Northern India as the previous one; it was severe in the north of Persia, apparently under the preceding wave, but early in 1823 it commenced there again, and, it is said, extended as far north as Astrachan and Orenburg in the course of the year; at the same time, it advanced from Aleppo westward, and reached Latakia and Antioch, and extended along the Mediterranean, between Scanderoon and Seleucia, where it seems to have stopped.

In 1826, another cholerific wave passed the isoclinal 30° N., and the epidemic disease prevailed in Northern India and China. In 1827 this wave passed beyond the isoclinal 53° N., and the epidemic affected Tartary extensively, but did not advance westward

range. There was also much fever in Western Europe these two years.

In 1828, febrile disease was particularly severe throughout the Mediterranean, and plague raged in Egypt, Syria, Greece, Constantinople, and in the Danubian Provinces, and continued to affect these countries, and embraced Odessa the following year. In 1830, plague prevailed from Bassorah to Aleppo along the Euphrates, also in Egypt and Syria. The mortality among the troops in the Ionian Islands was as high as the previous year, and petechial typhus raged in the kingdom of Naples. There being no notices of the prevalence of fever over the western coasts of the Black Sea this year, it most probably had diminished considerably, coincident with the advance of cholera westward. I have no information as to the prevalence of fever through Europe in 1831, but, according to Muchison, typhus was prevalent in London that year, as also in Scotland, and the mortality among the Dragoons and Infantry of the Line, from fever, was much higher than usual.

In 1830, as mentioned above, plague prevailed in Egypt and Syria, and, consequently, though these countries are in the same zone as Northern India, cholera did not appear in them in 1830, the first year of this wave in the zone, but was delayed until 1831, the second year, when the plague had greatly diminished. The mortality from fever was considerably higher among the troops at Malta and Gibraltar in 1831 than the preceding or following years, though, in the Ionian Islands, it was little more than half what it was in 1830. The deaths from fever among the troops on the home station were all much reduced in 1832; this disease was less prevalent among the population in London this year, too, though it was still active in Ireland and Scotland, and also among the troops in Canada.

In 1832, plague was prevalent at Bassora, Bagdad, Mecca, and other places in the Arabian Gulph. I have no information as to whether it was in Egypt. In 1833, there was a large increase of mortality, from fever, among the troops in the Ionian Islands, and a considerable rise at Malta, and in 1834, the ratio in the

into Europe, though the cholerific influence was still marked among the troops in the Mediterranean.

In 1828, the succeeding cholerific wave passed the isoclinal 30° N., and cholera was very severe in Northern India. In 1829 this wave passed into the zone beyond the isoclinal 53° N., and in August the epidemic broke out in great force at Orenburg, and about the same time, at Tabriz, Tiflis, and in the northern parts of Persia, and it prevailed among the Tartar tribes to the north of the Persian frontier. In 1830, the second year of the wave in this zone, the epidemic extended westward of the Caspian and Volga, and embraced Russia as far as Moscow and Kazan, and in 1831, Poland, south shore of the Baltic, Hamburg, North of England, and even Iceland.

In 1830, when another cholerific wave passed into the zone between the isoclinals 30° and 53° N., there was no great activity of the disease in Northern India. In 1831, when the wave passed the isoclinal 53° N., cholera became epidemic in Egypt, and also appeared at Smyrna, Constantinople, and in Hungary. The following year, when the wave had entered the zone to the north of the isoclinal 70° N., the epidemic embraced England, Scotland, Ireland, and North of France, in Europe; and America, from the Gulf of Mexico to Canada.

In 1832, the following cholerific wave passed into the zone beyond the isoclinal 30° N. There was an increase of cholera in Northern India, which became still more frequent the following year. This wave passed into the zone beyond the isoclinal 53° in 1833, in which year Lisbon became affected, and Havanna, and

former was sustained, and that at Malta was again much increased, while plague was rife in Egypt, Tripoli, and at Constantinople. At Gibraltar, the deaths from fever were much diminished in 1834. I have no evidence regarding Morocco in either year. In 1833, there was a sensible increase in the mortality from fever among the troops in the West Indies, and in Jamaica, though diminishing, it was still high.

It was mentioned above that, in 1834, plague prevailed at Constantinople, Egypt, and on the coast of Barbary, as far as Tripoli, while fevers were common among the troops in the Ionian Islands and Malta. In 1835, plague continued very severe in Egypt. Pernicious fever was rife at Athens, though there was less fever at Gibraltar, Malta, and the Ionian Islands. In 1836, plague was very severe in Constantinople and through European Turkey, as far as the Danube. At both Malta and Gibraltar there was a considerable increase of fever over the previous year. Fever increased in England and Ireland in 1836. In 1837, the plague continued in the Turkish Provinces along the Danube, but I have no notice as to whether fever was more frequent than usual to the northward. In England, Scotland, and Ireland there was, this year, a severe epidemic of fever, which extended into the following one.

In 1836, the Pali plague, which had been quiescent some years, reappeared in Marwar, and affected the country to the north-east, as far as Delhi. The following year, fevers in the northern part of India were particularly prevalent and severe. In 1836, the mortality among the troops in the West Indies from fever was greatly increased. In Jamaica, on the contrary, it was much reduced, though still high; but, in 1837, not only Sierra Leone, on the east of the Atlantic, but Demerara, on the west, and the West India Islands, as well as Jamaica and Cuba, New Orleans, Bermuda, suffered from a severe epidemic of yellow fever. In 1837, too, plague was frequent from Tripoli along the Barbary coast, to Alexandria, through the southern part of Syria and western part of Asia Minor, and continued up to the Danube. The mortality among the troops in the Ionian Islands, from

Mexico, which is in the same zone as Northern India. In 1834, the second year of the wave, Spain was embraced in the epidemic, and it crossed the Straits of Gibraltar into Morocco. This year, too, beyond the iscoclinal 70° N., Great Britain, Sweden and Norway, and north of Germany to the south of it, were included in the epidemic area, together with the United States, Canada, and Nova Scotia, and even Iceland.

In 1834, another wave entered the zone beyond the isoclinal 30° N. This year there was not much cholera in Northern India, but there was a considerable epidemic in the lower districts of Abyssinia, the second year of the wave there; whether it had shown itself the previous one, I have no information. In 1835, the wave passed the isoclinal 53° N. Cholera became epidemic in South of France, extending up the Rhine to Valence, and in Italy from the Alps as far south as Naples, and the following year in Sicily. In 1836, the wave passed the isoclinal 70° N.; there was little heard of the epidemic in the North of Europe, but, in 1837, it seems to have prevailed at Dantzic, Berlin, and other places in the North of Germany.

In 1836, another cholerific wave passed the isoclinal 30° N. This year the disease was not very active in Northern India, but became considerably more so in the following one, though I have no definite information as to the districts it occupied. In 1836, in the western hemisphere, the epidemic broke out in Central America, causing great mortality in the St. Salvador district, on the Pacific side. It was also experienced at Honduras. In 1837, the wave entered the zone beyond the isoclinal 53° N. Cholera became epidemic in Malta, and reappeared in Sicily, Naples, Rome, and South of Italy, in a severe form, and it extended to Northern Italy and South of France; it was also experienced slightly in various parts of Egypt, in North of Syria, and Armenia. It does not appear that the wave caused any epidemic either in Europe or America to the northward of the countries here mentione

fever, was four times higher than the previous year, and even at Malta itself remained pretty high.

In 1837, plague had been prevalent from Tripoli to Egypt, and to the north as far as Constantinople. In 1838, this disease seems to have nearly disappeared from Egypt, but it continued severe at Constantinople, and in 1839 there seems to have been some at Broussa, on the east coast of the Sea of Marmora. The mortality from fever among the troops in the Ionian Islands and Malta rose considerably in 1839. In Great Britain, in 1840, fever was, on the whole, less frequent than the previous years, but was still prevalent in several places.

In 1840, plague existed at Cairo, Alexandria, and through the Delta, as a pretty severe epidemic, also through Syria, extending into 1843. In 1841, plague was very severe at Erzeroum, and fevers prevailed from Bombay northwards, and even in the villages around Simla.

Plague, as mentioned above, continued in Syria in 1842 into 1843. In the latter year fever was very prevalent from Agra northwards, and in Upper Scinde.

In 1838, a cholerific wave passed the isoclinal 30° N., and there was a considerable increase of mortality in Northern India. There was a slight epidemic in Egypt; whether there was any in Persia I have not heard. In 1839, the wave passed into the zone beyond the isoclinal 53° N., but I have no notice of cholera being epidemic anywhere in it, though the course of the wave was apparent in the Mediterranean by an increase of common or sporadic cases, and the following year in England and Canada.

In 1840, the next cholerific wave passed the isoclinal 30° N.; there was a considerable increase of cholera among the troops in Bengal, but a great reduction among those in Bombay, and in 1841, the disease was more prevalent in Bengal, while in Bombay it was still further reduced.

In 1842, another cholerific wave passed into the zone beyond the isoclinal 30° N., and there was a severe epidemic among the troops both in Bengal and Bombay. The following year its force was much reduced. I have no evidence of this wave having led to any outbreak of the epidemic form of the disease anywhere to the northward.

In 1844, the fever noticed the previous year seems to have continued in Upper Scinde at least unabated. The 78th Highlanders, between August and March, 1845 (stationed there) buried 669 of their number, nearly all from this form of disease. At Ghazeepore, the 29th Regiment lost 85 men from fever in 1844; so that part of the year, at least, that disease must have prevailed much nearer Calcutta. In 1845, I have no notice of the prevalence of fever over Upper India, or in Persia or Egypt; but in all the Mediterranean stations the mortality from that form of disease was considerably less than in 1844, but in all of them it increased very much in 1846. In 1847, fever, which had increased perceptibly at the end of the previous year, became very prevalent in Great Britain and Ireland, and continued into the following year. Fever was epidemic in Prague and Upper Silesia in 1847, extending into 1848, and intermittents prevailed

In 1844, the following cholerific wave passed the isoclinal 30° N. There was a considerable mortality from cholera in Northern India, but not much greater than the preceding year; but, in 1845, there was a very large increase. This year the epidemic was severe in the north-west provinces of Bengal, the Punjaub, and it invaded the hill districts; it also affected Cabul, extended through Persia as far as the Tigris, and is said to have been at Bokhara in November. In 1846, the epidemic recommenced in the North of Persia, it affected several places in Armenia, passed beyond the Caucasus, along the west side of the Caspian, and traversed the country of the Kirghis Tartars between the Sea of Aral and Orenburg. In 1847, the epidemic was at Moscow in September. In 1845, this wave overspread the zone beyond the isoclinal 53° N., and in 1846, that beyond the isoclinal 70° N. The severe part of the outbreaks mentioned in this paragraph

to an unprecedented degree in Sweden in the latter year.

I have no notice of the prevalence of fever in Egypt or Syria in 1846. On the West Coast of Africa there was the epidemic in the "Eclair," and at Bona Vista in 1845, which was followed up in 1846 by severe fever at Teneriffe, and a large increase in all our military stations in the Mediterranern. In 1847, as already stated, fever was epidemic in Prague and in Upper Silesia; in Great Britain and Ireland, in Sweden, and in all these this form of disease prevailed through the greater part of 1848. In 1847, fevers were also very prevalent in New Orleans and the Southern States of America, and in New York, Buffalo, and Canada, and in all of these continued active through most of 1848.

The returns of disease among the troops in the Mediterranean and North American Colonies not having been published from 1847 to 1858 inclusive, the information as to fever through the Mediterranean and in Canada is imperfect, and the analysis could not be carried out with advantage, owing to the scantiness of the information.

In 1864, east of the Ganges, fever was very prevalent in the gaols, and population generally, from Lucknow, northwards; to the west of the Ganges, it was also very severe at Agra, and prevailed at Nusserabad, Neemuch, and as far as Mhow and Baroda, and included Umballa, Lahore, and Pesha-

were, consequently, under the second year of the wave in each.

In the beginning of 1846, a cholerific wave passed the isoclinal 30° N. The mortality in the Bombay Presidency was very great, and the sudden outbreak at Kurrachee took place, and the epidemic extended through Persia, and as far north as Diarbekir, and to the westward as far as Aleppo; Aden and Mecca were also included in the epidemic area. In 1847, the wave passed beyond the isoclinal 53° N., and the disease overspread European Russia as far as Moscow. In 1848, the wave passed the isoclinal 70° N., and cholera became epidemic in Petersburg and Finland. About the beginning of October it commenced at Bergen, in Norway, and in England and Scotland, and, about the middle of November, in Belfast, and became a severe epidemic in 1849 throughout Great Britain. The "New York," with emigrants from Havre to New York, was attacked at sea, near the American coast, on the 25th of November, and the "Swanton," also with emigrants from Havre to New Orleans, about the 29th of November, within 10 days of her arrival. The disease commenced in New Orleans apparently on the 13th of December, and by May, 1849, was at Chicago and New York and intermediate districts, and the following months in Canada.

In 1864, a cholerific wave passed into the zone beyond the isoclinal 30° N. This wave reached Bombay towards the end of August, 1863, and its first year thus extends from September 1863 to August 1864, inclusive. The mortality there from cholera in that period was 4,813, as against 2,358 for the preceding 12 months, the second year of the previous wave, showing distinctly a great aggravation of the causes of the disease under the advancing wave.

East of the Ganges, cholera was not epidemic in 1864 farther north than Lucknow, Fyzabad, and Goruckpore, while, west of that river, Allahabad, Suagor, and Mhow, indicated its northern limits; but sporadic cases were reported at Bareilly, Umballa, Lahore, and Peshawur. In 1865, the

wur, to the north. In 1865, the southern margin of the fever field to the east of the Ganges maintained the same position as in 1864, and cholera did not advance; to the west of this river, the southern margin of the fever field receded to between Agra and Delhi, but still embraced Ajmere and Pahlunpoor, while, in the Punjaub, it continued as prevalent as the previous year.

A febrific wave was passing to the northwards about this time, the manifestations of which it is necessary to describe. This wave passed the isoclinal 30° S. on the 1st of January, 1863, and we have indications of its influence in the severe and prolonged fevers Baker and his companions suffered from this year, about 3° N. of the Line, when exploring the sources of the Nile. In 1864, this wave passed into the zone north of the isoclinal 0°. There was this year a considerable increase of mortality from fever among the troops in Ceylon and in Burmah. At Aden fever was considerably more prevalent among the troops than in 1863, though it caused much the same mortality. There was a terrible outbreak of plague, apparently, at Khartoum, at the junction of the White and Blue Nile, while at Cape Coast, in Western Africa, the troops suffered very much from fever. In 1865, when this wave overspread the zone beyond 30° N., there was a severe epidemic of fever at Hong Kong; it continued, as mentioned above, in Upper India, and a malignant typhoid fever raged in the marshy districts on the Euphrates during the summer months. Fever seems also to have been very prevalent at Beyrout during summer, and at Broussa, on the south of the Sea of Marmora. There was also, in the early months of 1865, an uncommon prevalence of low fever, with typhoid symptoms, at Cairo. On the West Coast of Africa there was much fever at Sierra Leone this year; also in Demerara and Grenada, in the West Indies. At Malta and Gibraltar, too, in 1865, there was a decided increase in the mortality from fever, though it was still moderate. In 1866, when this wave passed into the zone beyond the isoclinal 53° N., there was a considerable increase of fever among the troops at Malta, though at Gibraltar there was much less. At the Gambia, this year, fever was prevalent and fatal, also among the epidemic made no advance to the east of the Ganges, but west of it its area extended so as to include Agra, Ajmeer, Neemuch, and Baroda, while a few sporadic cases occurred in the north of the Punjaub, as in 1864. The epidemic was felt slightly at Kurrachee, and passed along the south coast of Persia as far as Lingar, at the entrance of the Gulf, but nowhere penetrated the interior, as it had done in previous invasions. Early in 1865, the epidemic was raging at Mokullah, a port on the south coast of Arabia, 280 miles east of Aden; and it seems to have appeared at Hodeida, on the Arabian coast of the Red Sea, in lat. 15° N., about the same time. In the end of April or beginning of May, cholera was recognised as prevailing among the Pilgrims at Mecca. On the 21st of May it was on board ship at Suez, on the 2nd of June at Alexandria, and made its appearance at Malta on the 20th, at Smyrna on the 21th, and in the beginning of July it showed itself, almost contemporaneously, at Jaffa and Beyrout, to the east of the Mediterranean, at the Dardanelles and Ancona to the north, and at Valencia to the west. In 1865, this wave overspread the zone beyond the isoclinal 53° N., and the epidemic passed to the northward with considerable regularity; it was experienced at Constantinople at the beginning of July, in the Black Sea, at Trebizond to the south-east, and Kustendji on the west, and for some distance along the Danube in the first week of August, at Odessa on the 6th, and Kertch on the 17th of that month. It reached Berditchef, in the government of Kiew, in Southern Russia, on the 27th September, and Altenburg, near Leipzic, about the same time, or a little later. The disease also prevailed in Italy and South of France during summer, and reached Paris about the 15th of September; it also extended through Spain in the course of summer and autumn. In the West Indies, the Island of Guadaloupe was attacked on 22nd October.

It is worthy of observation that, though about 20,000 pilgrims landed at Suez between 20th May and 22nd June, most of whom passed on to Alexandria, and among whom several cases of cholera occurred during transit, yet the first manifestation of the epidemic in Egypt was at the farthest point they reached. From Alexan-

troops in Demerara and Trinidad, and prevalent, but not so severe, among both troops and inhabitants of Barbadoes.

dria, the epidemic area extended to the eastward and southward, so that Aboukir, Tanta, and Cairo were included in it on 17th June, Zagazig and Mansoura, on 20th, and Damietta and Suez (the inhabitants) on 26th; along the Nile it embraced Minieh on 30th June, and Kenneh, lat. 26¼° on 23rd July. At Toussoum, on the Suez Canal, upwards of 40 miles from the latter town, there was an isolated outbreak, commencing on 16th July, among labourers occupied in excavating earthwork—always a dangerous occupation during epidemics, and near Suez itself, labourers similarly employed were affected with choleraic diarrhœa in June, and one case proved fatal among these on the 22nd of that month. This movement of the epidemic eastward was not confined to Egypt, but was observed in Syria and Southern Russia as well. Though cholera was at Jaffa and Beyrout in the first week in July, it does not seem to have reached Nablous until considerably later, and though a few sporadic cases were said to have appeared in Jerusalem prior to 22nd August, it was about the 10th October before the epidemic fairly declared itself there. At Damascus the first case was in August, and at Aleppo the disease commenced on 11th August, while, farther to the east still, Bagdad had its earliest cases on 25th September, and Mosul on 23rd October. In Russia, though the epidemic had been at Odessa in the first week, and at Kertch on 17th August, it did not appear at Taganrog, at the head of the Sea of Azof, until 12th October, and on 14th November there was an outbreak at Zadonsk, to the north of Voronez, and nearly on the same meridian with Taganrog.

Towards the end of 1865, the epidemic ceased to advance northwards, but remained in a subdued form in France and some other parts of Europe. In 1866, however, when the wave passed into the zone beyond the isoclinal 70° N., as soon as the weather began to get mild, cholera again became active, and the epidemic gradually crept up to and passed that line, in Russia, Sweden, and Norway, Great Britain and Ireland, and appeared in the United States, not only from New York and Boston to Chicago, but embraced Savannah, New Orleans, and Galveston, in the South. It was scarcely experienced in Canada,

however, there having been 13 cases only in Stratford, a small town in the western part of the country, in the month of October.

In the West Indies, cholera became epidemic a second time in Guadaloupe early in 1866, and appeared also in Martinique.

The details given above, when carefully examined with the aid of the map, will leave little doubt that the progress of epidemic cholera has been most materially influenced by the existence of fever fields in its course. It may be useful, however, to recapitulate the chief points before concluding the paper.

In Northern India, it has been shown that cholera frequently did not occupy the whole country, but existed with severity in one part, while another was free from it. The evidence at my disposal did not permit me to define these portions accurately for any epidemic anterior to that of 1864-5; it is obvious, however, that in 1818-19, in 1836, in 1840, and in 1844, the prevalence of fever in the western part of that country had materially interfered with the extension of cholera there. In 1864–65, the details in the Sanitary Report for Bengal and other sources, admit of the limits being laid down with tolerable accuracy, and they bring out the remarkable fact, that, for two years in succession, cholera presented itself as a severe epidemic, from the sea on the west, to the foot of the Himalayas, its northern limit just embracing Baroda, Neemuch, Ajmere, Agra, and Lucknow, and, during these years, the country to the north of this line was suffering from a severe epidemic of fever. As illustrating that point farther, I may mention that the fever diminished greatly in 1866, and remained comparatively low during most of 1867, and it was in the end of 1866 only that cholera passed the line it had reached in 1865, and became developed into the extensive epidemic of 1867 in this district.

The extension of epidemic cholera westward in 1823 seems to have been checked by impinging on a fever field extending from Egypt through Asia Minor. The circumstances in 1826–27 were similar, and again in 1828–29, in the latter of which years the disease had reached Astrachan, but the apparent diminution of fever to the west of the Black Sea, and probably also over South of Russia in 1830, permitted it to extend into Europe that year. In 1830, when a fresh wave was passing up, Egypt being occupied by plague, cholera did not appear there; but in 1831, when the plague diminished, cholera took its place, and the same year affected Smyrna, Constantinople, and Hungary, and, in 1832, north of France and Great Britain, the fevers previously rife in these countries having then decreased. In 1833, under a fresh wave, Lisbon, Havanna, and Mexico were affected, and, in 1834, the epidemic embraced Spain, Morocco, Great Britain, Sweden, and the United States and Canada. In these years the South of France and whole of the eastern part of both shores of the Mediterranean were free from cholera; but as far as the evidence serves, fevers were very prevalent over them. In the West India Islands also fever increased in 1833, and in Jamaica the ratio of deaths from it, though lower than the previous year, still remained considerable, so that the non-extension of cholera to the south here, as in 1865, was coincident with a frequency of fever in the districts which escaped.

In 1835, the South of France and Italy, from the Alps to Naples, which had hitherto escaped, became affected with epidemic cholera; in 1836, Sicily was included. In these years, especially the latter, there was much fever in Gibraltar, Malta, and through Greece, Turkey, and Egypt. In 1837, under a fresh wave, Malta became affected, and the above districts again suffered, but Greece and Turkey escaped, the latter, at least, still being extensively affected with plague. The limitation of the epidemic for three years to France, Italy, Sicily, and Malta, in the centre of the Mediterranean, while the surrounding countries, as far so our evidence goes, were occupied by fever, is a very striking fact.

In 1847, cholera was again at Moscow, and in the course of 1848 it spread through North of Germany, and reached England late in the year. There had been much fever in the Mediterranean in 1846, and in 1847 this embraced Great Britain on the one hand, and Silesia on the other; the fever declined in

Silesia in the course of 1848, and towards the close of the year in England, before the cholera acquired much force; the same feature was observed in Sweden and the United States and Canada.

The relations of the two epidemics in India, in 1864 and '65, has already been noticed. The immunity of Persia, Arabia, and West Coast of the Red Sea from cholera, in 1864, seems to have been connected with the prevalence of fever in these countries that year, and in 1865, when the epidemic extended to them, it established itself slowly, and only when the fevers previously occupying the various districts diminished. In this way, it did not radiate from Suez, where the pilgrims were supposed to have carried it, but from Alexandria, and then extended eastward and southward in a regular manner, not along certain lines of communication, but over the whole face of the country, and the same peculiarity was observed through Syria, and as far as the Euphrates.

In submitting these remarks to the Profession, it appears advisable to remove an erroneous impression regarding the scope of my views as to pandemic influences which seems very generally entertained, that is, that I regard them as the sole causes which produce epidemics. It is difficult to understand how this misconception could have arisen, as in all my papers on the subject it was expressly stated that, in accounting for the local developments of disease we have to deal with, both causes connected with persons, and with localities as distinguished from persons, must be taken into consideration, as well as those of a more general nature. It is true, that if the operation of general causes be conceded, the influence hitherto attributed to those depending on persons or localities must be profoundly modified, but their recognition, and the true limits of their operation, are no less necessary for a philosophical explanation of the generation and spread of epidemics than before the pandemic influences were thought of.

APPENDIX, No. XIV.

REPORT ON AN OUTBREAK OF CHOLERA SPASMODICA AT BRITISH HONDURAS, 1867-8.

By Staff Assistant-Surgeon KEARNEY, Senior Medical Officer.

IN the month of December 1867, this disease first appeared at this station of Belize. As cholera had been raging in New Orleans (with which place we had free communication) for some time previous, every preparation had been made beforehand, and every precaution adopted both in the town (by the Board of Health) and in barracks.

On the 16th of December a vessel named "Petronilla" arrived at Belize from New Orleans with a number of Southern emigrants on board. As there appeared to be no sickness on board they were allowed to land; on that day a man, an inhabitant of Belize, died at one of the landing wharves, it was supposed from eating unripe almonds. He was not seen by a medical man. On the night of the 17th four people (two women and two children) died of this disease. On learning this fact I applied to have the men removed to Corosal, about 150 miles from Belize, which was immediately done. Previous to this attack the station was healthy, and neither dysentery or diarrhœa was prevalent.

From this date cases sprung up daily amongst the black population in Belize, but the Europeans, whether on account of better diet or more cleanly habits I am unable to say, seemed to enjoy immunity from it, only two cases having occurred, one of which proved fatal. A small number of the men were necessarily left behind at Belize to guard stores, &c. These men were left in charge of Dr. Hunter, a civil practitioner, as I was obliged to proceed to Corosal with the men, and amongst these so remaining there occurred four cases, one of which proved fatal.

I should state that from the commencement of this disease, or shortly after, diarrhœa and dysentery prevailed very largely amongst the Europeans, but they were mild cases, and none proved fatal. During the attack disinfectants, &c., and every care that could be taken in compliance with the Cholera Regulations laid down in the War Office Circular were employed in Belize by Dr. Hunter, and the beds of the cases attacked were burned, as also all the clothes, &c. Throughout the time this disease prevailed it was, generally speaking, very amenable to treatment when taken in time, and the fatal cases, I was informed by all the medical men, were moribund when they were first called in. As far as I can learn there occurred in the town of Belize 160 deaths, but I could not find out what number of cases of cholera occurred, as the medical men kept no registry. On the days that the cases of cholera occurred amongst the men I found that the amount of ozone in the air was small, generally being only 2°. From Belize this disease spread up to Corosal, Orange Walk, Indian Church, and northward across the Rio Hondo into Yucatan, where it raged furiously, we were informed, amongst the Indian tribes; but the out-station of Young Girl about 150 miles up the Belize River, and almost removed from intercourse with that town, was entirely free from that disease.

On arrival at Corosal I chose the site of the old barracks, about one mile from the town and close to the sea, for the camp. This had been in ruins for a long time, and the ground grown over with thick brushwood. All communication was cut off from the town. The camp was surrounded with a ditch and rampart (field-earthworks), which, together with the necessary clearing of brushwood, &c., gave the men sufficient employment both of mind and body; drills, &c., were discontinued. The tents supplied were bell-tents, with double walls, &c., new pattern, and, as we were well supplied with them, they had fewer

men than regulation required; I believe six men were the numbers in each. The latrines were built over the sea, and required very *little* supervision. The men were put on field rations (at my recommendation), and were supplied with waterproof-sheets, &c. The men made beds of bundles of straw or grass tied together, and laid their waterproof-sheets above this, which made very good beds, and kept them well from the ground. During the day, if fine, these beds and the blankets were put out in the sun, and the walls of the tents were folded up, so that cleanliness and free ventilation were procured. The Cholera Regulations were carefully attended to as well as circumstances permitted. About 21st of January Corporal H., of the 4th West Indian Regiment, V.C., who was employed as orderly corporal, bringing down rations, orders, &c., to the contractors, was attacked with diarrhœa, which he let go on, in spite of all directions issued, for nearly 24 hours; in a few hours after his admission he was attacked with collapse, and, although he partially rallied for a short time, he ultimately sank.

About this time a number of cases appeared in Corosal; but, although I had numerous cases of diarrhœa, some accompanied with severe cramps, I had no other case amongst the men. This diarrhœa was generally easily controlled with a castor-oil draught, containing also liq. ammoniæ, tinct. catechu, tinct. card. comp., tinct. zingib, and camphor mixture; but in one case I had to use lead and opium pills, and in another case a lead and opium enema before I checked it, compound chalk mixture, &c., having failed. None of these cases had rice-water stools. On the death of Corporal H., I had the hospital marquee fumigated with the following:—Chloride of sodium, manganese, sulphuric acid, and the floor of the marquee covered with fresh lime; after a few days I did this over again; then had the marquee removed to another part of the camp, and the floor of the late hospital space covered over with brushwood, and this brushwood kept burning for several days and nights. The bed, &c., was also burned. The close stool was immediately put into the sea, where it remained, woodwork and all, for nearly a week, and, as disinfectants were daily used when it had been in use, I deemed this sufficient to guard against all further danger. I could not find out what number of cases occurred amongst the civil population, nor even the number of deaths. But I believe they were not near so large as in Belize. One medical man (a Spaniard) reported having cured 35 cases; his treatment was large bleeding, even in the stage of *collapse*. Shortly after this Staff Assistant-Surgeon Bate, in medical charge of the detachments at Orange Walk and Indian Church, reported that several cases had appeared at the former station, and shortly after this that cases had appeared at Indian Church. On receiving this report I at once recommended the removal of the detachments to Corosal, and after a short delay (boats for transit being then scarce) they were brought down: no cases occurred amongst them. During the whole outbreak only five men were attacked—four in Belize, and one in Corosal; two of these proved fatal. There were no cases amongst the women and children in camp.

During the whole time the men were encamped, a fatigue party daily went round the camp under my own inspection, cleaning up any *débris* of vegetables or bones, &c., in or around the tents, and any objectionable spots were covered over with fresh lime. Dr. Hunter informed me that the same practice was carried out at Belize. I also occasionally had the tents shifted and their floors covered over with fresh lime. But I was unable to move the camp about and change it, as the clearing of fresh ground would throw too much work on the men.

The water (rain-water caught in iron tanks) was brought from the town of Corosal, and I had the barrels used for this purpose occasionally charred inside, as is the practice in the Navy.

The two mentioned at the beginning of the Report were, I believe, Frenchmen. The same was the case at Corosal, at Orange Walk, and at Indian Church; but several of the Spanish residents died. I have been informed that there was only one attack of cholera here previous to this, and the Europeans seemed to enjoy the same immunity at that time as during this attack.

This outbreak was undoubtedly caused by seeds of disease brought from New Orleans. It was not due to any atmospheric agency. It was brought in

by the ship "Petronilla" from New Orleans, and extended from Belize to such places as were in constant communication with it.

The station at Young Girl was very far removed from Belize, and there was hardly any communication with it (I believe about once a month was all). In this station there was neither cholera, diarrhœa, or dysentery during the period. The population of the town of Belize is from 8,000 to 10,000 inhabitants, Corosal probably nearly the same. Orange Walk contains from 2,000 to 3,000. I could obtain no information as to the number of deaths at Orange Walk or Indian Church; the number 266 is given for Corosal and Belize.

APPENDIX, No. XV.

ON DELHI BOILS.

By Staff Assistant-Surgeon J. Fleming.—Mean Meer, 20th March, 1869.

The pathology and treatment of the so-called boils and ulcers, peculiar so Delhi, have often been discussed. Commissions composed of experienced Medical Officers have given them their consideration, and Medical Officers serving with European and Native troops in Delhi have at various times recorded their observations, endeavoured to account for their nature, and pointed out numerous modes of prevention and treatment. Notwithstanding all the suggestions that have been made, these ulcers are yet very prevalent, and affect more than 15 per cent. of the troops stationed at Delhi. I have been induced to record what I have observed regarding these boils and ulcers while stationed in Delhi during the year 1865 and January 1866, and I hope that others who have opportunities may investigate the subject more fully in the same direction. The name "Delhi boil" is a misnomer, and calculated to mislead as to its real nature. It is a morbid growth affecting the skin and subcutaneous tissue, which after some time ulcerates, and has hardly any of the characters of a boil. There is no inflammation until the ulcerative stage. The boil commences without any pain or inflammation in the skin, and resembles a mosquito bite in its primary stage. This little, light red spot increases in size slowly, is well defined, and becomes raised above the surrounding skin, which is of the natural colour. The growth continues to spread for two or three weeks or more, and its characters during that time are unmistakeable. In some cases, when about the size of a pea, it can be moved backwards and forward under the skin; in others it is incorporated with it, and that more especially towards the ulcerative stage. As it progresses, it becomes more elevated and vascular, the tortuous dilated vessels passing over it being easily seen, accompanied with a pricking sensation and itchiness in the majority of cases, and spreading at the base. A vesicle forms at the apex, which discharges a pale yellowish serous fluid. Then the ulcerative stage begins, and spreads rapidly until the whole of the growth is destroyed. The ulceration does not end here, but attacks the neighbouring structures; and if the ulcer is situated near the eyes, nose, or lips, these parts will almost be sure to be destroyed or materially injured, not excepting the cartilages of the nose. During the growth of this tumour, and up to the period when ulceration commences, it appears, relatively to the surrounding skin, very transparent, often shining; and, if examined by a good lense, will show one or more yellowish spots, deeply seated about the centre of the tumour.

The tortuous dilated vessels, the transparency of the tumour, and the yellowish deep-seated spots about its centre, are characters which I have noticed in many cases at some stage before ulceration. I invite particular attention to these spots. If one be cut down upon with dissecting needles, a small, circular yellowish body, with a glistening capsule, which it is just possible to detect by the naked eye, will make its appearance, and can readily be removed; but great care must be taken, as the least flow of blood during the operation of extraction will be sure to carry it away and lead to disappointment. In the woodcuts on a subsequent page (p. 330), some of these bodies are shown, magnified. Examined with the microscope, they seem to be composed of an apparently fibrous envelope, arranged in concentric laminæ, inclosing fluid contents. They are of a yellow colour, and not unlike in general appearance the ova of animal parasites, with the exception that they are not so transparent, and do not show their interior clearly, which may be owing to their greater relative size; but there is a considerable quantity of granular matter around the capsule of the ova. I shall, at present, call them ova for want of a better name, or until their real nature has been satisfactorily proved.

If these bodies are examined with powers of 1,000 or 1,200 diameters, a number of apparently wavy tubules are seen in every direction, and some of them seem to even pass out of the enveloping capsule, as if they were designed to retain the ovum *in situ* in the tumour.

The history of the "Delhi boils," their mode of growth, the symptoms that accompany them, and the effects of treatment, rather tend to point out that their cause is local and not constitutional. Medicines taken internally seem to exercise but little effect, and their prevalence cannot be explained by the excess of nitrates or nitrites in the water at Delhi, nor can they be said to be dependent on malaria.

If I might venture an opinion, I would say they were caused by a parasite, probably an animal parasite, or its ova, or both. The matter from a Delhi ulcer is said to produce, when inoculated in a healthy person, a perfectly similar ulcer, and besides, it has been observed that an ordinary sore in Delhi often takes on the character of a Delhi ulcer. If, then, this view is the correct one, the treatment is evident and simple, and will go far to prove their parasitic nature. As soon as it appears in the form of a small tumour, or when first detected, destroy it completely, whether it be with a strong caustic solution or the actual cautery. This is the treatment which has of all other plans, when properly performed, been eminently successful. If ulceration has been established for want of attention to the earlier stages, strong caustic lotions should be from time to time applied, and the ulcer treated according to general principles. The number of cases of Delhi ulcer amongst the troops is said to be diminishing lately; and if this is so, it will, I think, be found in a great measure owing to the early effectual local treatment. No doubt the supply of a purer water to the city, and greater attention to its general sanitary condition, should be attended with a proportionate diminution of disease; but there is reason to think that the waters of Delhi have little, if any, connexion with the origin and propagation of the "Delhi ulcers."

APPENDIX, No. XVI.

ON DELHI BOILS.

By Staff Surgeon-Major ALEXANDER SMITH, M. ., Lucknow, May, 1869.

When recently (16th January to 26th March, 1869) in medical charge of British troops at Delhi, I became aware of the fact, that no fewer than 57 decided and 9 suspicious cases of "Delhi boil" had been detected among the men of the detached wing of the 79th Highlanders alone, between December 1867 and the end of February 1869. I could therefore only conclude that the report which had been made public, to the effect that, owing to better barrack accommodation and increased space, and, above all, in consequence of the use of "Jumna" water, the disease might be said to have left the garrison, had been somewhat premature.

At the same time that my attention was arrested by the discovery of the discrepancy of facts referred to above, a perusal of the opinions recorded by the various Medical Officers connected with the Indian Service, who had been from time to time specially employed to investigate this matter, forced upon me the conviction that but little was known of the real nature and origin of the complaint in question.

I was driven to adopt this view of the matter because the opinions which those officers had recorded, and which may be summed up as being to the effect that the boils are only the local manifestation of a general disease caused by drinking and using with the food a bad well-water, and by the respiration of impure air, appeared to be untenable on two grounds: first, because the substitution of Jumna water for that drawn from wells, as regarded culinary and drinking purposes, had not banished the disease; and, in the second place, because there is no evidence that the atmosphere to which the soldiers are exposed at Delhi is now, in any appreciable degree, less pure than that which exists at other Indian military stations.

Knowing, therefore, that Delhi boils are still prevalent among the troops, and that too to a very serious extent; feeling assured also that the measures hitherto trusted in to eradicate the complaint have signally failed to do so; and maintaining likewise that up to the present time the views advanced in explanation of its nature and origin have fallen short of attaining that object, I will now endeavour to note a few important particulars which I have observed in connection with this disease, and from which I will hope to be able to deduce conclusions which may render it possible to place the measures to be adopted for its prevention and cure on a basis of a more sound and practical nature than has hitherto existed.

Although these boils would appear to have occurred with much greater frequency, and to have shown characters of a more decided intensity at Delhi than anywhere else in India, there is yet distinct evidence that they are not confined to that locality, but prevail, to a certain extent, at other stations as well. This is more especially the case in respect of Lahore and stations in Scind, where the affection in question is known under the names, respectively, of "Lahore" and "Scind boils." The disease is also met with at Agra, Meerut, and Roorkee, as well as at Umballa and Mooltan; and it seems probable that, were attention sufficiently directed to the matter, it would be found to exist at many other stations besides.

That the boils met with at the places mentioned above possess features which are in every respect identical in appearance, and probably in respect of their cause also, I can bear personal testimony, as regards at least those met with at Delhi, Lahore, and Roorkee; and it would indeed be strange should it be found that an affection, of which the description by various observers points

to diseases so closely identified with each other in appearance, should not bear a like identity as to cause also. I cannot help thinking, therefore, that it is but reasonable to conclude that further observation will establish, in every respect, the identity of all.

As it occurs at Delhi, the disease does not generally manifest itself until after a residence at the station of several months' duration. A few cases are noted as having occurred so early as the second or third month after arrival, but more were observed from the sixth to the eighth months of residence. The largest proportion of all would appear to have fallen between the tenth and twelfth months, whilst, so far as I could ascertain, but few escaped attack who remained in the place continuously for much over a year.

Although, in essential points, the Delhi boil presents a tolerable uniformity as regards general appearance, yet in its progress it shows, in some respects, a variety so considerable, in different individuals, as to have led to its being classed into different forms, according to the course it follows after the initial stage has been passed.

The earliest indication of the formation of a Delhi boil is usually discovered in the form of a small, slightly elevated, almost painless papule, which shows but slight inflammatory redness. After the lapse of several weeks, the papule, in one form of boil, slowly developes itself into a small, flattened, indolent abscess, which, either when left to burst of its own accord, or when opened by incision, is found to have been filled with pus mixed with blood of a dark venous colour.

Of this last, also, there is generally a pretty copious flow after the original contents have been evacuated. When these have been discharged, there remains an apparently excavated pit, which for a time continues to enlarge by ulceration, does not readily take on a healing action, and, when it does so, fills up with extreme slowness.

Coincident with the later changes in the original boil, the area of diseased skin is being gradually extended by a zone of redness with slight tumefaction. This, on close inspection, is found to be made up of a fresh set of papules similar to the original one. These fresh points of disease are, as a general rule, arranged circumferentially to the original one, with which, as with each other, they appear to be continuous, owing to the blending of their marginal redness where they touch.

A process of slow suppuration, and of changes similar to those which took place in the original point of disease, happens to these secondary ones also.

At the same time that these changes are going on, the general boil is being extended by a still further addition of zones, differing only from the first in the fact that each succeeding set becomes less marked than its predecessor, until the power of further advance would seem to fail the disease, and it fades away into the surrounding healthy skin.

The healing process, which commences in the centre, gradually follows the spread of the diseased action outwards (both processes going on at the same time), until eventually, after perhaps many months of tedious progress, the ulcerated surface heals entirely, leaving only a very shallow but deeply-coloured cicatrix.

In a second well-marked variety of Delhi boil, the course of the disease is still more indolent in character, and slow in progress, than that which has just been described. The formation of pus is less decided, and the tendency is, for what does form, to get crusted over and dried into a scab which conceals an ulcer underneath. Like the first variety, this also extends, at the circumference of the original boil, by rings of fresh points of disease, these becoming less active in character, and more slightly marked in degree, as the distance from the centre increases, until at last, as they become shaded into the sound skin, the whole puts on very much the appearance of an ordinary ringworm.

In this, also, which is known as the "dry" variety, reparation begins at the centre and extends outwards. It ends likewise in a highly-coloured and very shallow cicatrix, or rather depression, the destructive action on the skin being less marked in this than in the other variety.

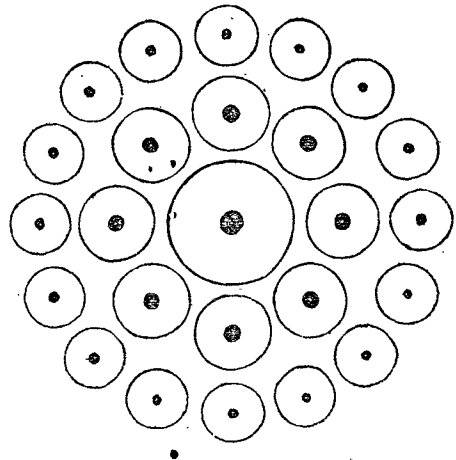
Of a third form, I saw one good example. It was situated on the forehead, and consisted of a circular patch of a red colour, and about an inch in diameter. It was but slightly raised above the level of the skin, and was studded with

small, slowly suppurating points. This form is, I believe, slow in progress, and its tendency is to end eventually without much actual ulceration.

Boils situated on the tips of the elbows (localities in which they are frequently met with) are, from the nature of their position, liable, among soldiers, to injury during movements in the ranks. In consequence of the blows the boils are then apt to receive, they generally put an appearance peculiar to themselves, inasmuch as they become large, elevated, and unusually red and shining. They are for this reason more painful than the other varieties, and are liable to crack and bleed; but they do not, as a rule, ulcerate extensively. They generally heal eventually by a slow scabbing process.

The feature of special importance, in the progress of Delhi boils generally, to which I would again particularly direct attention, as being likely to assist in throwing light on their origin, is their commencement by a single point of disease, their subsequent increase by fresh zones of similar points, and their spreading slowly from the centre to the circumference, each succeeding addition becoming less marked, until the disease appears to lose the power of further extension. This cessation of action generally happens by the time the boil has attained the diameter of from about an inch or an inch and a half to two inches.

The annexed rough diagram will assist in explaining the idea I wish to convey of the ordinary manner in which a Delhi boil extends itself. It does not necessarily do this, however, either with the regularity (for it may extend more to one side than to another) or with the amount of definition which the diagram would indicate, but still its style of progress is much after this fashion.



It is only, however, on close inspection that the punctiform arrangement can be made out, the redness of the component parts of the boil, and the tumefaction as well, shading into each other so as to give to the whole an appearance of unity which it does not in reality possess.

In only one case did I observe the disease extend itself in a manner different from that I have above described. In that particular instance, a soldier had on the front of his wrist a boil of the kind first described. Some time previously, and when the disease had made considerable progress, an ineffectual attempt was made to destroy it by a powerful escharotic—sulphuric acid having been, I believe, the agent employed. A portion of the skin had been thus completely penetrated, and much irritation, attended with inflammation of the superficial absorbents, excited. These last could be traced as painful cords running along the forearm, whilst at one or more points of their course, and at a distance of several inches from the original boil, small indurations formed. These gradually softened, and were opened; they discharged the characteristic boil matter, and when I last saw them the resulting sores had assumed the characters usual to small Delhi boils.

A further characteristic which Delhi boils possess in common, and which it

is of importance to bear in mind in endeavouring to explain their nature, consists in the fact that, unless when powerful escharotics have been employed in the course of treatment, the ulceration rarely penetrates completely through the true skin. This is very plainly indicated by the broad, shallow, and unpuckered cicatrix which remains after the boil has healed.

From observing the uniformity with which this appearance of the cicatrix occurs, I have been led to conclude that the cause of the Delhi boil, to be referred to afterwards, probably has its seat chiefly in the sebaceous follicles, rather than in the sweat glands, as these latter lie quite in the under layer of the corium, and in many instances also are situated even under the latter. The sebaceous follicles, on the other hand, do not penetrate deeper than the substance of the true skin.

The parts of the body most liable to be attacked are, in order of frequency of occurrence, much as under:—First, the ulnar side of the dorsal surface of the forearm, then the wrist and front of the forearm, after that the elbows, and lastly the hands.

The neck and face come next in order, and then the knees, legs, and feet. On the trunk of the body, Delhi boils are rarely seen.

The belief entertained by other observers, that Delhi boils are merely the outward manifestations of a blood disease, mainly induced by drinking bad well-water, led to Jumna water being substituted for the latter, for drinking and cooking purposes.

I have, however, already shown that this change has had no apparent effect in banishing the disease; and I must now beg leave to add further, that I have altogether failed to discover any evidence, of a trustworthy character, which would indicate that these boils are in any way signs of general disease, or other than an affection of a purely local nature.

Bearing in mind, then, the fact that no change has up to the present time been made in respect of the water used for ablution purposes, which has always been procured from the wells in the vicinity of the barracks, it becomes apparent that, if the disease is caused by water at all, it can only be by its application to the surface of the body.

It will be necessary, therefore, in order to arrive at some definite conclusion on this part of the inquiry, to consider whether there exists any relation between the parts of the body to which water is most frequently applied, and the localities which are most liable to be attacked with Delhi boils.

That such a connection as that above referred to does actually exist, I believe that the record of the following facts will leave very little room to doubt:—

The parts, then, which are most frequently attacked are exactly those to which, from their position, the water used in ordinary ablution is most likely to gravitate, and which are at the same time time those last and least carefully dried. These are accordingly the very parts which have been already enumerated—namely, the ulnar portion of the back of each forearm a little above the wrist, the points of the elbows, the wrists, forearms and hands, and the sides of the neck.

When a soldier performs his ablutions, he does so with his shirt-sleeves rolled above his elbows, the bench on which his basin is placed is generally a high one, and he usually washes both head and face at the same time. By the time he has finished the hard rubbing necessary to dry his hair, the hands and arms will have become almost dry, and the amount of friction which those parts receive is therefore proportionately small, making the conditions for the entrance of animalcules, or their ova, should the water contain any such, into the ducts of the skin, all the more favourable.

In addition to the above reasons for determining its occurrence in the parts of the body just enumerated, the appearance of the disease there is also much favoured by the skin being liable, at the same points, to become chapped during the cold season, it being a fact well recognized by those quartered at Delhi, that the slightest abrasion of any part of the skin, apt to be frequently wetted, is almost certain to become the seat of one of the boils in question.

The truth of much that has been stated above receives also the strongest corroboration from the additional fact which came to my notice, namely, that scarcely a single dog belonging to the military, which may have been for any

length of time in Delhi, escapes contracting the disease on the tip of the nose—that part of the animal's body which, in structure and functions, most closely resembles the skin of the human subject.

In lapping fluids, dogs generally wet their noses more or less; and the only water to which these animals have access in the fort at Delhi, during most of the year, is (in addition to that of the large well which can be reached by a flight of steps) that which collects in the gutters and puddles about wells, the water in the tubs of ablution-rooms, and that used for wetting kus kus tatties, all of which is drawn from the neighbouring wells.

During the late unusually dry season, the canal water was irregularly supplied to the fort: the dogs, therefore, could have drunk but little from that source; and the Jumna water, used by the troops for cooking and drinking, as it is stored in the filters and other vessels for the purpose, could scarcely at all have been got at by them. In as far, then, as regards the water which touched their bodies, the dogs were placed very much on a par with the men.

The description of boil, also, from which the dogs suffer is identical with that known in the human subject as the dry variety, of which mention has already been made.

The only instance which has come to my knowledge of a Delhi boil occurring on any other part of a dog's body than his nose, happened where a cut on the leg, received in coursing, became the seat of one.

When, therefore, the habits of the dog are considered, and the highly organized structure of the skin of its nose, as compared with that of the rest of its body, is borne in mind, it does not seem difficult to arrive at a rational explanation of the peculiarity observed in regard to the locality of attack in the animal in question, and the important bearing which it has on the elucidation of the whole matter cannot fail to be at once recognized.

From the information I have been able to collect on this point, it would appear that Delhi boils, known as "aurungzebie", and so named because there exists a tradition that the Emperor Aurungzebe suffered from this disease, have been prevalent for many years past among the natives of Delhi.

It does not appear, however, that they have suffered from the complaint to an equal extent with the British troops stationed there since 1867. This may in some measure be accounted for by the custom which prevails among all classes of the adult native population, of daily performing their principal ablutions in the River Jumna, to which they stream at early morning with great regularity. Owing to this habit, the use by them of well-water for ablution purposes becomes considerably restricted, and in this respect the native residents enjoy a considerable advantage in regard to exposure to what is in my opinion the exciting cause of the disease.

From what came under my own observation in the streets of Delhi, however, in respect of the large number of young children seen to suffer from Delhi boils, I was led to conclude that the disease was considerably more prevalent among them than among grown-up people. For this I could only account by supposing that, as they were rarely if ever seen being taken to the Jumna with their parents, it must be the custom to wash them at home in water drawn from the city wells—a practice which would place the native children in a position, as regards liability to the disease, much on a par with that of the troops.

The fact that the whole of the clothes-washing of Delhi is done in the Jumna will in like manner also explain why the washermen are not attacked by Delhi boils in a greater proportion than other natives. It is, however, more difficult to account for a similar exemption from more than the average liability to attacks which the water-carriers enjoy, unless it be that, as the infecting water is drawn from wells, they are not exposed to the amount of wetting by it which would be incurred were the supply obtained from tanks or watercourses, in which case it would, as a rule, be necessary for them to stand in the water whilst filling their water-skins. Thus they, even although fetching all the water believed to cause the disease among the troops who wash in it, are themselves but comparatively little exposed to its exciting cause.

As regards, also, the mode of carrying the water-skin, which might have been expected to cause boils on the part of the body on which it rests, I have made special inquiries, and have ascertained that there is less risk from this

arrangement than might at first sight have been expected, as several folds of the dress usually intervene between it and the man's skin. Accordingly, therefore, the information I obtained on this point went to show that, although the water-carriers are liable to suffer, like other natives, from the disease on their hands and arms, as well as on their feet and legs, they do not do so in any unusual degree, as compared with other classes.

It now only remains for me to state the conclusions as to the nature and origin of the Delhi boil at which I have arrived, after a careful consideration of the various facts bearing upon the disease, and to record the points of a practical nature which their study has inculcated :—

1st. In the first place, then, the conclusion to which I am almost irresistibly forced, by collating the various facts above recorded, is, that the disease is not only one of a purely local nature, but that the boils by which it manifests itself are merely the breeding places of some description of animalcule, which, impelled by the laws which regulate the process of alternate generation, finds means, through the medium of the water, by itself or its ova, to enter either through the natural pores of the skin by a wound or abrasion of its surface.

The irritation caused in the substance of the skin by the slow process of development which then ensues, gives rise to the formation of the initial point of the boil ; and from this last, as from a centre, the subsequent extension of the disease slowly proceeds, after the manner which has already been described, and during the time the process may continue in activity.

Why the fresh points of disease should form at a certain distance from the centre of the original one, and the subsequent additions made to it be, as a general rule, arranged in encircling zones, may perhaps be rendered more easy of explanation when it is remembered that the swelling of the original portion of the boil would probably, by causing occlusion of the ducts and follicles for some distance outwards from its centre, prevent the entrance of fresh exciting materials, in the shape of ova or animalcules, overflowing from the first portion of the disease. Nor would it, on this supposition, be until just clear of the inflamed zone, or at all events until quite its margin had been reached, that the potency of these natural openings would be found comparatively unaffected in this way.

The explanation of the tedious nature of the progress of the complaint, when left to run its natural course, is probably to be found in the fact that each succeeding extension of the disease is, to a certain degree, a separate repetition of the process of development which initiated the whole, and which goes on being re-enacted, each time with less intensity, until the process dies out, and, coincident with that, the disease fades away into the surrounding sound integument.

2nd. The points to which an interest of a practical nature is attached, are those having reference to treatment and preventive measures.

As regards the first of these considerations, from the views I entertain as to the nature of the disease, the conclusion became unavoidable, that the proper course to follow would be to endeavour to destroy whatever living forms the boils might contain, by applying to them such substances as are known to be peculiarly inimical to the vitality of the lower orders of animal life. Carbolic acid and corrosive sublimate were the agents that naturally came first to my mind, and I elected to make trial of the first named, on the ground that its action on the body would be more likely to be restricted to its effect on the part to which it was more immediately applied than might possibly be the case were the corrosive sublimate made use of.

Acting on the principle enunciated above, and as fitting opportunities presented themselves, the incipient boils were, as soon as they had declared themselves, opened by a crucial incision proportioned to their size, and the interior of the boil freely cauterized with pure fluid carbolic acid applied by means of a dossil of lint on the end of a probe. When the cut surfaces showed, by their complete change of colour, that they had been sufficiently acted upon to ensure the thorough penetration of the boil by the acid, a small piece of dry lint was laid on the surface, and retained there by a strip of adhesive plaster.

The usual result was the complete arrest of the disease, and the rapid healing of the small sore caused by the acid, under cover of a scab, which formed with the lint on its surface.

Deterred by the unsatisfactory results which I saw had followed on a stimulating and escharotic plan as applied to the more advanced stages of the boils, I employed, instead, a soothing treatment by means of lotions of acetate of lead with opium, sponging with warm milk and water, and the occasional application of poultices; my object in such cases being, as I could see but little prospect of arresting the disease at the stage to which it had then advanced, to place the parts in as favourable a position as possible for awaiting nature's mode of completing the process going on within them. The result of this plan of treatment, so far as I had time to judge of it, was highly satisfactory. I can, however, see no reason to doubt that, even in such cases, the duration of the disease would be much shortened were the fresh unopened points which surround the central sore in the more advanced boils, treated individually in a manner similar to that used so successfully in the case of the incipient primary ones.

An escharotic plan of treatment by hot iron, and such means as strong sulphuric acid, had already been employed by other Medical Officers. Its use, however, does not appear to have been regulated by any fixed principle such as I have laid down, and as its application was not restricted to the incipient stages of the disease, its success was not always complete. Nevertheless, the fact that the disease could, at its outset, be completely burned out, had already been recognised.

I think it right to note here, in connection with what I have written above, that I have recently had the misfortune to be able to verify in my own person the value of the abortive treatment of Delhi boils.

About a week before leaving Delhi, I had noticed, in the skin covering the last joint of my left thumb, a slight swelling, which at times itched a little, but which I hoped was only the result of a musquito bite, to which it bore a close resemblance. After my arrival at Lucknow, however, this gradually assumed all the characters of an incipient Delhi boil, and it began to get painful from being frequently struck against objects. After observing it closely for about a fortnight, I laid it open and applied carbolic acid. Within a week the spot had healed, and there now only remains a slight discolouration to mark where it was.

From what I have shown above, I hope it will be conceded that I am fully justified in asserting that all that is required to completely check the advance of the disease, supposing that the soldiers are still required to continue, as heretofore, to wash in well water, is to carefully inspect the whole garrison once a month, or oftener, and, without delay, to subject each incipient boil, or suspected spot, to the treatment above detailed, the employment of which will rarely, if ever, render it necessary to exempt a single man from the performance of his ordinary duties.

I have, moreover, no hesitation in further expressing my belief that, under such a course of procedure as that recommended above, when once the existing fully developed Delhi boils have healed, they need not, under ordinary care, be ever again seen to prevail to any considerable extent among British soldiers.

As regards the measures of prevention to be adopted, it naturally follows, from all that has gone before, that the one point of essential importance to be marked in this direction, is the discontinuance of the use of well water for purposes of ablution, and the substitution of river water to be used on all occasions; for, although I have failed to discover the slightest evidence that Delhi boils are caused by the internal use of water from any source, it is yet quite apparent that water so highly impregnated with salts and organic matter, as analysis has proved Delhi well water to be, cannot be used as drink or with food, without, in some measure, unfavourably affecting the general health.

The proposal to construct waterworks, and supply both the town and fort with water raised from the River Jumna, which is, I believe, at present engaging the attention of Government, would entirely meet the case; but, in the meantime, and until more complete arrangements can be made, the ablution water might be drawn from the canal of Jumna, water which now enters the fort. All that would be necessary to allow of this being at once carried into effect, would be the construction of a tank in which to allow the water to

deposit the mud with which it becomes discoloured, from the rapidity of its flow causing attrition of the canal banks.

What applies to Delhi in this respect does so also, with equal force, to the other stations at which boils of a similar nature prevail. Of all such stations, it may here be remarked, in passing, that they possess this feature in common of being, as a rule, those very cantonments in which the military garrisons are, in whole, or in part, most closely associated with a native population rendered unusually dense by having its building space limited by city walls, and of which the soil has become saturated to such a degree, by the accumulated impurities of ages, as to impart to the water of the wells an amount of impregnation with organic and inorganic matters seldom met with elsewhere, and which cannot fail to be highly favourable to the development and growth in them of some of such of the lower orders of animal life as might, in the course of the stages of change through which it has been discovered that they pass, be likely to lead to the production of the complaint now under consideration.

Where, however it might not be practicable to substitute river water for that drawn from wells, and where, also, military reasons might render it imperative that forts should be provided with a water supply independent of sources without their walls, the wells within their area might be greatly improved by frequent cleaning out, and by occasionally submitting their brick-work linings to washing with lime impregnated with carbolic acid. This measure would, however, have to be employed under such supervision and restrictions as would prevent their being taken into use again until the first results of this process of cleansing had completely passed off.

Upon the last, and not least, interesting part of this inquiry, that which has reference to the discovery and identification of the actual exciting cause of the disease, which the various facts above recorded give such strong reasons for believing to exist in the Delhi boils, in the form of some description of animal life derived from the water in which the men wash, I regret to state that the time of my stay in Delhi was not sufficient to enable me to do more than barely initiate this part of the investigation.

The few facts which were observed, however, are recorded in the hope that they may be found of service in any future inquiry into the matter.

A cursory examination of the well water satisfied me that it contained a profusion of forms of minute animal life; but it became at once apparent that to advance with any prospect of success in the inquiry, the identification of whatever of that nature the Delhi boil might contain, must be made the starting point.

Accordingly, with the aid which Assistant-Surgeon Doig, 79th Highlanders, and M'Creery, of the Medical Staff, were kind enough to give me, and for which, especially to the former, I am much indebted to them, a series of microscopic investigations was commenced with the object of examining, first, the discharges from the open sores; second, the contents of the less advanced boils; and lastly, with the view of thoroughly searching the solid structure of the boil itself.

The appearances seen under the microscope were, to the best of my ability, carefully figured, and the general results duly noted.

A summary of these observations is given below, and a few sketches of what was seen are appended.

The following is a tolerably accurate enumeration of the appearances revealed by the microscope, in the course of so much of this part of the inquiry as it was found possible to carry out. These were:—

1st. Blood discs, colourless corpuscles, pus cells, and epithelium, requiring no special notice.

2nd. In all the specimens of matter peculiar to the recent boils, as well as in the discharge from the resulting sores, there was observed a large amount of what was to all appearance granular matter of a dark colour, but of a size so minute as to be beyond the power of the microscope at our disposal to define its actual structure in respect of walls or contents.

3rd. There were seen also a large number of peculiar bodies varying in shape from an elongated oval to that of a kidney or crescentic form. These were of a dark chocolate brown colour, as seen by transmitted, and of a bright orange red, as viewed by reflected light. Their average size was probably equal

in length to about five or six blood discs, by about two and a half to three in width. They had distinct cell walls, and were filled with minute dark coloured granules. They varied much in transparency. In some the contained granules could be distinctly seen throughout the whole interior of the cell, whilst in others the transparency was so slight, that it was only at the margins that their contained granules could be defined, their centres appearing to be almost black. These bodies appeared at first to be confined to the contents of the boils and the discharges from their resulting sores; but more extended observation showed that they existed in such numbers on the skin, and appeared, as a rule, to be so almost universal as to show that but little or no importance could be attached to their presence in the boil-discharges, into which they probably, in every instance, gained admittance accidentally from without. Their shapes were, however, carefully copied, and rough sketches of them are appended below. They are numbered one of the series.

4th. In the discharges of several of the open sores were seen, on a few occasions, oval shaped bodies having distinct cell walls and granular contents. In colour and size they much resembled those which have just been described above. At one end of these, however, there appeared and disappeared a dark spot, and the cell wall in the immediate vicinity of this became temporarily more transparent as if by being rendered thinner from protrusion and consequent tension at the moment when the spot was most distinctly visible. No circle corresponding to hooklets could be detected near the dark spot, but the bodies in question were presumed to be living distomata.

Figure 2 (on next page) gives a very good representation of this.

5th. Having carefully examined the contents of boils, and the discharges from sores, with the results recorded above, I next proceeded, on the last day I was able to devote to the inquiry, to endeavour to search the structure of the boil itself, by removing with a small pair of forceps portions from the interior of one. A number of specimens were procured in this way, but in only one of them was anything noticed which had not already been seen in the earlier examinations.

In the exceptional instance there was discovered an animalcule of a somewhat tadpole shape provided with a well marked head, and having a tail of considerable length in proportion to the size of the latter; on one side of the head there was a spot of which the colour became alternately light and dark, and where a limited portion of the thickness of the cell wall, of which the head appeared to consist, showed a contracting and expanding action, as if from the presence of a mouth or sucker. The tail, also, seemed at times to have a slight languid motion of the nature of retraction, but of this I could not feel quite certain.

Of the appearance which I attributed to the action of a mouth or sucker I could not doubt the existence.

Mr. M'Creery examined this animalcule with me, but he did not feel certain that it lay under the cover glass. My own belief was that it did so, and that it really formed part of the specimen taken from the boil.

The apparent size of the head was probably about one and a half blood discs in length by about one in breadth. Its tail might have measured about seven in length.

Figure 3 gives a fair representation of it with the phases it passed through.

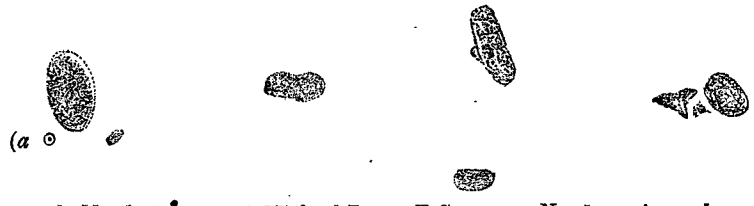
This was unfortunately the last set of observations I was able to make.

The time at my disposal for carrying out this investigation was short, but my opportunities for observation were good, and I gave the matter my most earnest thought; and although the microscopic part of the inquiry had to be left incomplete, I would still venture to hope that what I have been able to record, and the recommendations I have made, will not be considered altogether without value, or fail to prove of service as regards both the cure and prevention of what has been, for a number of years past, a source of much suffering to a considerable number of the British troops serving in India.

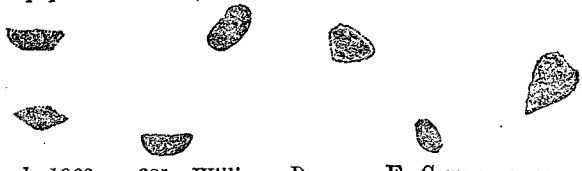
I have, in conclusion, only to add, that I consider it much to be desired that no opportunity should be lost of preserving such examples of Delhi boils in their variousstages, as the deaths from other causes of men suffering from them may render it possible to procure; and I would further beg leave to recommend that they should be carefully preserved in spirits, and then sent to

England to be submitted to some one of the eminent microscopists there, whose experience in conducting inquiries connected with the special branch of natural history which bears on this matter, would be a guarantee for the speedy and final setttlement of the question involved in this inquiry.

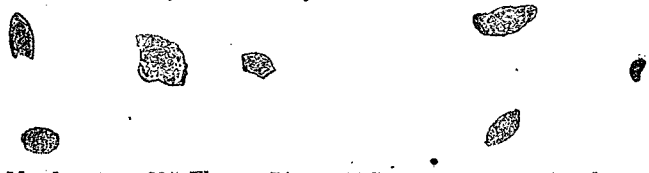
No. 1.



9th March, 1869.—405, Michael Barry, F Company, No. 1 specimen, largest and smallest sizes. (*a*) The blood disc, to be taken as scale for all the drawings in this paper



9th March, 1869. — 681, William Downey, F Company, some of most characteristics of No. 1 ; all extremely dark.

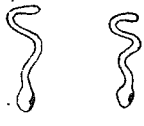


9th March, 1869.—695, Thomas Linton, F Company ; 1, 2, and 3 characteristic from No. 1 specimen ; No. 4 characteristic from No 2, all very dark.

No. 2.

No 2.—bodies believed to be living distomata. One figure shows the mouth retracted, the other the same protruded.

No. 3.



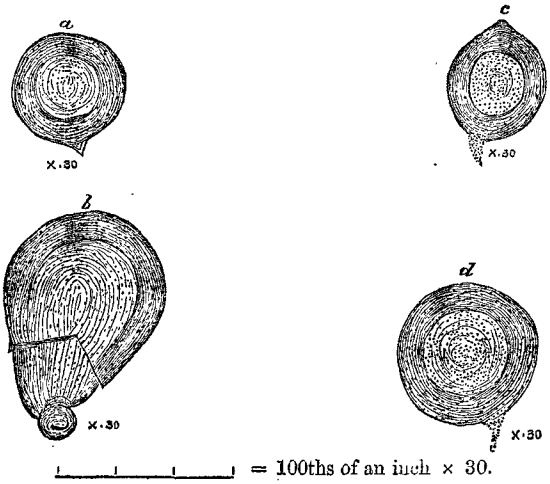
No. 3.—The animalcule seen on the last day of the inquiry. By the difference which exists between the two figures it is endeavoured to represent the amount of motion believed to have been seen in the tail.

APPENDIX, No. XVII.

REMARKS ON THE FOREGOING PAPERS ON DELHI BOILS.

By Dr. AITKEN, Professor of Pathology, Netley, November 1869.

ON the subject of Delhi boils, or Lahore sores, Staff Assistant-Surgeon Joseph Fleming has written to me from Mean Meer in the Punjab, of date 15th June, 1869, enclosing also the accompanying drawing.



= 100ths of an inch × 30.

(Drawn by aid of the camera.)

Figs. *a* and *b*, extracted from Delhi sores, January, 1866.
Figs. *c* and *d*, extracted from Lahore sores, May, 1869.

These drawings are from specimens in the possession of Dr. Fleming, and were obtained from different persons.

He describes the bodies extracted from these sores as egg-like; and he is of opinion that the sore is of local and not of constitutional origin. In most cases before ulceration these bodies can readily be detected by the aid of a lens; and when extracted they appear of a yellowish-white colour, with a glistening capsule, resembling very much the eggs of some beetles. In many of the sores, and in different stages of them, Dr. Fleming found modified hair bulbs, long and conical, often more than a quarter of an inch in length, and externally made up of epithelium.

What these bodies are he considers still to be a question; but from a more recent letter (of date Sept. 20th) he thinks they may be modified hair bulbs or gland ducts. He hopes to be able to investigate the subject more fully at Delhi.

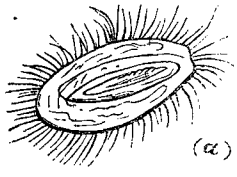
Although these observations of Dr. Fleming are short and fragmentary, still they are important when taken into consideration with those of Dr. Smith's. Both observers agree in having found peculiar bodies varying in shape. The observers, however, differ as to the relative sizes of these peculiar bodies, which they respectively describe.

The general appearance of the bodies described by Dr. Smith as abounding in the open sores, appear to me to be of the nature and size of the ova of distomata rather than distomata themselves; and the drawings of Dr. Fleming

are also not inconsistent with this view, if they are not circarial forms of encysted distoma, or modified hair bulbs only. Moreover, the locality or site of the lesion is consistent rather with the development of minute parasitic growths (such as ova or encysted embryoes) than with the locality of the mature distoma, which inhabits the intestines and bile ducts of men and animals. The ova of these are well known to exist in foul water, and they find a place for the first stages of development in the bodies of soft animals, such as fish, mussels, snails, and the like. Their development is believed to be an example of "alternate generation," the most remarkable in the history of reproduction.

The mature distoma is a rather large parasite found in the bile ducts or intestines, of all grazing animals, *e.g.*, horse, elephant, ass, hare, rabbit, squirrel, antelope, deer, beaver, and man; and they are oviparous. The egg varies extremely in size in the various distoma. It is characterized by an operculum or lid at the end (indicated in some of Dr. Smith's figures), and when this lid opens it gives vent to a ciliated embryo, long known as an "*opalina*" among "*infusoria*."

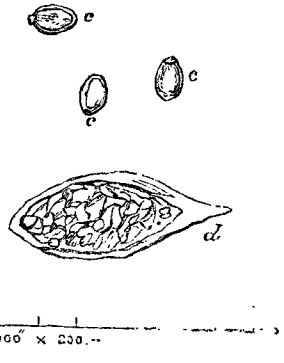
Agassis made the discovery that a genuine opalina (fig. *a*) is hatched



from the egg (fig. *b*) of a distoma.

As such they are found in sewage water (see Hassall's Reports on the Waters of London); and in the fæces of animals infested with distoma in the bile ducts, the ova pass into the bile and escape with the fæces. The ova continue to develop in water or on moist places, each egg finally producing an embryo, which swims freely by cilia. They die in pure water, as many vermicular animals do. The more dirty the water, and the more full of organic impurities, the more does it abound in food fit for the those embryotic parasites. Their future development is the history of "alternate generation."

The accompanying drawing, in which all the figures are drawn to the same magnified scale (which is appended), shows how the ova of distomata vary in size.



Figs. *c*, *c*, *c* are ova of a distoma taken from the bile-ducts of a healthy man. The man was a pirate and was executed in China. His body was inspected by Staff Surgeon-Major Gordon Hardy. The distomata were about nine lines in length, and some of them are in the Museum of the Department at Netley, kindly given by Dr. Hardy, from which the drawings are made.

Fig. *d* represents the ovum of the *distoma hæmatobium* from a case of hæmaturia so common at the Cape of Good Hope, and given to the Museum by Dr. John Harley of London.

Figs. *e*, *f*, and *g* are respectively as follows: (*e*) ovum of *Distoma hæmatobium* from hæmaturia of the Cape of Good Hope (Dr John Harley); (*f*) embryo (ciliated) from ovum capsule; (*g*) embryo attached to the ovum capsule.

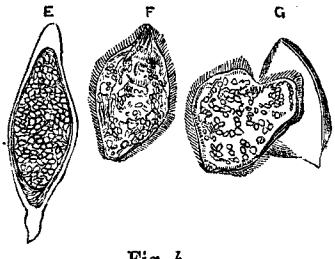
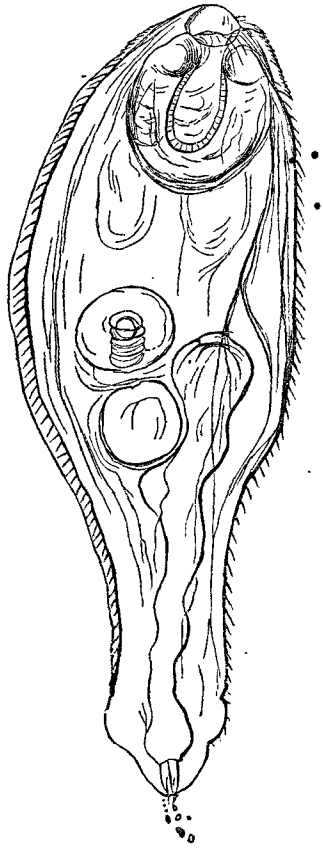


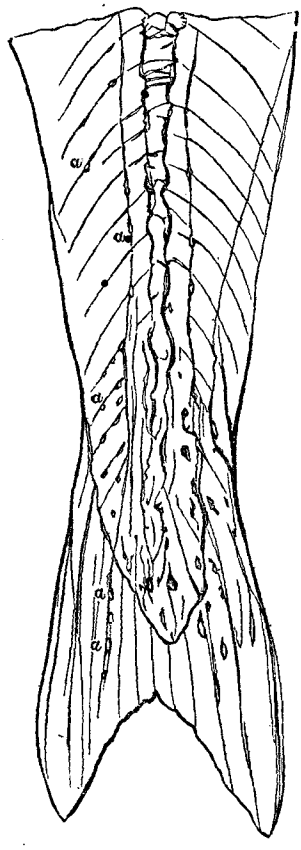
Fig. *h*.



This distoma (*Bilharzia hæmatobia*) was discovered by Bilharz in Egypt in 1851. It is so common there, and also at the Cape, that nearly half the adult native population are believed to suffer form it in some form. It inhabits the *vena portæ*, as well as the mesenteric, hepatic, vesical and intestinal veins, also ureters, and pelvis of the kidney. They are known to be most prevalent in those persons who drink the unfiltered waters of the Nile, and who consume fish from this river in a half putrid state. The symptoms in severe cases are those of intense constitutional disturbance, diarrhœa, chlorosis, pyelitis, or bloody urine. In the intestines they are associated with appearances resembling dysentery, with congestions of blood and with extravasations, also with exudations and ulcers of the bowel. In such severe cases the eggs are seen wedged in long rows within the intestinal vessels, or in and beneath the exudation on the free surface of the mucous membrane. Similar lesions are seen in the kidney and bladder.

Fig *h* is an outline of the circarial form of an encysted (and therefore immature) distoma liberated from its cyst. This figure is drawn to the same scale as the previous figures. This form of immature distoma exists in all the tribe of cod fish, and in this instance is taken from the common haddock, and removed from its cyst by dissection with needles.

Fig. *k*.



If the flesh be stripped from the backbone of a common haddock so as to expose the large nerves going to the tail (fig. *k*) and the larger fins, hundreds of white specs, *a*, *a*, *a*, quite visible to the naked eye, will be seen. Each of these specs is an encysted (immature) distoma, a cercaria. In the eyes of fishes they also inhabit the aqueous humour. Thus it seems highly probable that distoma enter the human intestinal canal as *circariæ*, and pass thence into the biliary passages ; and, accroring to the observations of Giesker and Frey, they may also penetrate directly into the skin, and undergo development in the subcutaneous cellular tissue. The eating of uncooked fish, whelks, shell-fish, and gardeu snails are all obvious modes in which immature distoma may enter the body of man, as well as through bathing or using impure water frequented by men or animals who, being infested with distoma (mature) in their bile-ducts, discharge their ova with the fæces which find their way to the water.

The observations alike of Dr. Smith and Staff-Surgeon Fleming are very suggestive, and, although the appearances are not similar, yet their dissimilarity is quite in keeping with the extremely varied forms in which distoma are found in the bodies of man and animals.

The investigations into the nature of the Delhi boils and Lahore sores ought still to be followed up in the direction so well began by these Medical Officers of the Army.

APPENDIX No. XVIII.

GUINEA-WORM AMONGST A DETACHMENT OF 2ND WEST INDIAN REGIMENT ON THE WEST COAST OF AFRICA.

By Staff Assistant-Surgeon J. A. B. HORTON, M.D.

GUINEA-WORM is known to be endemic in places where the geological formation of the country is decidedly volcanic in its origin, and where the soil is composed of trap or metamorphic rocks, undergoing rapid disintegration and intermixing with alluvial deposits. The Gold Coast of Western Africa is decidedly of this composition, and Guinea-worm is one of the most prevalent diseases amongst the troops stationed there.

The left wing of the 2nd West India Regiment arrived at Cape Coast Castle in June 1866, without, I believe, a single case of Guinea-worm among the men. On the 3rd February, 1868, a detachment of two serjeants, three corporals, and 34 rank and file, were ordered to Accra; they were in excellent health, presenting not a single case of Guinea-worm. On the 25th March, 1869, they were withdrawn from Accra, so that they remained there a few days over 13 months. The barracks where they lived were low, damp, and unhealthy; and they were allowed free access to the people of the town, who were subject to the disease.

Before they were withdrawn, Guinea-worm began to appear amongst them, and up to the time of writing more than 33 per cent. have been attacked and admitted into hospital, and more yet will have the disease. In one case, the exhaustion produced by the severe and intense inflammation, as well as the profuse discharges from the affected part, proved fatal.

It is remarkable that the men were attacked in various parts of the body at the same time, or as soon as one part gets well another appears. These prove without a doubt that the troops must have been placed in the focus of the disease; and when it is considered that these men remain for several months in the hospital, and that most of them were disabled for further active service, and were perhaps crippled for life, it is of the utmost importance that in Guinea-worm districts the barracks where troops are quartered should be carefully selected, and the men kept under some restriction, especially as regards the grant of night-passes during the rainy season, when the disease is most accessible to the human system.

The following cases, which comprise the men since admitted from the Accra detachment, will show how completely they were under its endemic influence:—

1. Private S. had *one* worm in the posterior portion of the left hip, *one* in the middle of the left arm, *one* in the inner portion of the right malleolus, *one* in the superior aspect of the right foot above the fourth toe, and *one* in the inner malleolus of the left foot.

2. Corporal W. R., *one* in the external malleolus of the left foot, *one* in the heel of the left foot, *one* in the back of the right knee, *one* in the plantar aspect of the second toe of the right foot, *one* in the middle half of the back of the right leg, and *one* in the calf of the left leg.

3. Private K., *one* in the middle of the superior aspect of the right arm, *one* in the external portion of the middle of the right leg, and *one* in the external malleolus of the right foot.

4. Private S. T., *three* around the external malleolus of right foot, *one* in the external half of the right leg, *one* in the external part of the right hip, *one* in the inferior aspect, *one* in the lower third external portion of the right thigh, and *one* in the upper third external portion of the leg.

5. Private B., *one* in the middle of the right foot, *one* in the lower third of the front of the right leg, *one* in the upper half of the back of the left leg, *one* in the external portion of the right hip, and *one* in the superior aspect of the large toe.

6. Private A., *one* two inches above the heel.

7. Private R., one in the left side of the middle half of the back, and one in the *middle* of the right leg.

8. Private A. H., *one* in the middle of the plantar aspect of the left foot, *one* in the middle of the right arm, and *one* in the plantar aspect of the large toe of the right foot.

9. Private S. G., *one* in front of the upper third of the right foot, *one* in the back of the leg (middle portion), and *two* in the inner and upper third of the thigh.

10. Corporal B., *four* around the knee of the right foot, *one* in the right inner malleolus, *one* in the inner side of the right foot, *one* in the inner side of the middle half of the right thigh, *one* in the external malleolus of the left foot, *one* in the middle of the inner side of the left leg, and *one* in front of the left knee.

11. Private C., *three* in the external portion of the left ankle joint, *one* in the lower third of the left arm, and *two* in the right side of the abdomen in the hypochondriac region.

12. Drummer P., *two* in the external malleolus of right foot, *one* in front of the right ankle, *one* in the inner malleolus of right foot, *one* in the lower half and back of the right thigh, *one* in the back of the left knee, *one* in the back of the upper portion of the left leg, *one* in the external malleolus of the left foot, *one* in the back of the left lumbar region, and *one* in the scrotum.

From the above it will be observed that the highest number of worms manifested in one individual up to the time of writing,—viz., three months after their withdrawal from Accra—was ten (in Corporal B. and Drummer P.); that, of the twelve men attacked, each man presented an average of five worms, and that the most frequent parts of the body attacked are the ankle, the leg, and the foot.

The following are the number of worms in the twelve cases which appeared in the different parts of the body :—

	Number of Worms.
Upper extremity :—	
Arm and forearm	4
Lower extremity :—	
Thigh	4
Knee	7
Leg	11
Ankle	15
Foot	10
Toe	3
Trunk of the body :—	
Abdomen	3
Back	1
Scrotum	1
Hip	3
Total number of worms	62

APPENDIX No. XIX.

APPARATUS FOR TREATING FRACTURED THIGH.

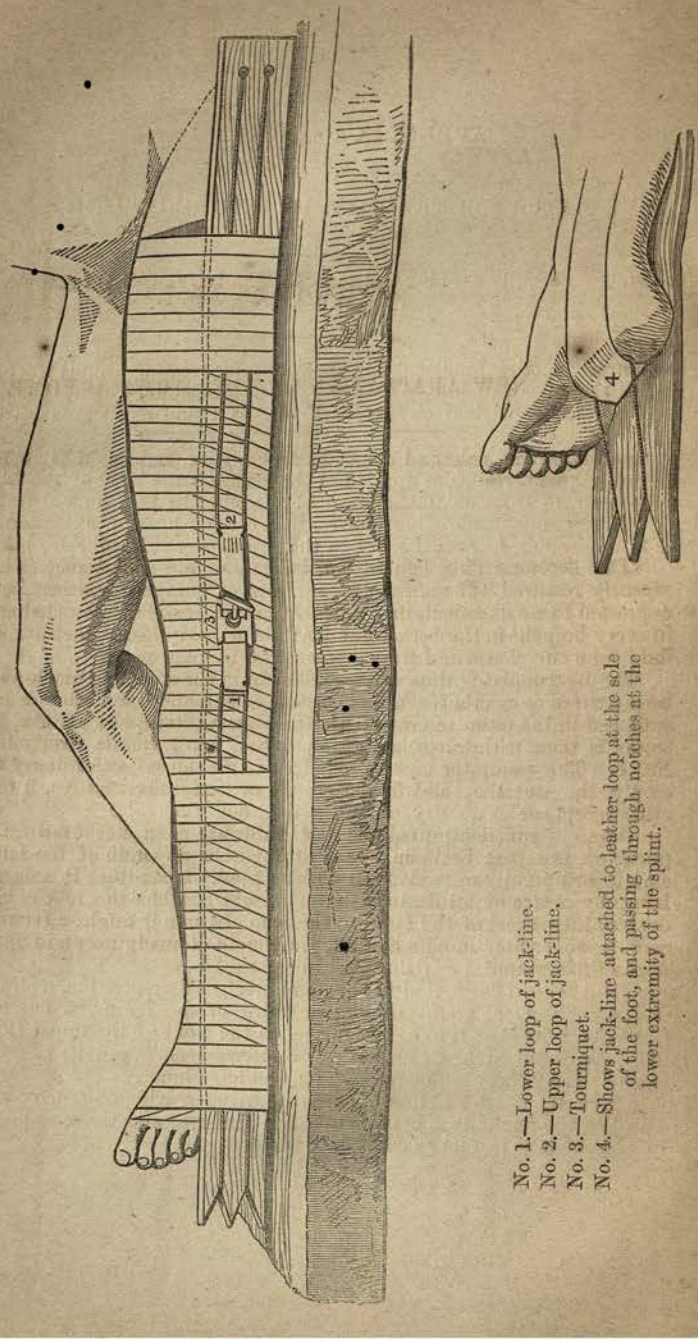
Designed and successfully used by Assistant-Surgeon OLIVER, M.D., F.R.C.S.I., 60th Rifles.

THE figures opposite represent an apparatus for treating simple fractures occurring at the upper, middle, or lower third of the femur, which, though it may not be entirely original on my part, will be found as effectual as it is simple.

A strap of light shoemaker's leather, 2½ inches wide, and rendered adhesive by means of unguent. resinæ, is applied to the leg from the head of the fibula, around the sole of the foot, to the head of the tibia, in the same manner as Hodgen, U.S., employs adhesive plaister for the purpose of extension. A bandage is then applied, from the toes to the groin, over this adhesive leather, while the limb is kept extended by an assistant. A perineal pad is next adjusted, containing, on its superficial aspect, a piece of jack-line, or thin rope, which is from 5 to 6 feet in length. A similar piece of rope is passed through the leather loop at the sole of the foot (see No. 4). A Desault's splint, well padded to fit the curves on the external surface of the limb, is then applied in the usual manner. This splint should extend from the crest of ilium to eight inches below the sole of the foot, and be one inch wider than that used by Desault, if an adult is under treatment. The two extremities of the jack-line containing the perineal pad are now passed through the two holes at the upper end of the splint, and knotted. The two ends of the line attached to the leather loop at the sole of the foot are next placed, one in each of the notches at the lower extremity of the splint, and then also knotted. One end of the strap of a screw-tourniquet is then firmly connected to the lower loop of line, and the other end is passed through the upper loop. While the limb is now being fully extended, an assistant pulls steadily at this free end of the tourniquet-strap until extension and counter-extension are complete; he then secures that end of the strap to the loop. Another bandage (starched) is now applied over the limb and splint, leaving the tourniquet and strap and both loops of line exposed as delineated in the sketch.

The patient is then supported in the semi-erect sitting position, and, if the fracture has occurred at about the upper third of the femur, a flat leaden weight is placed over the starched bandage on the front of the upper third of the thigh. Any amount of extension or counter-extension can now be easily exercised by simply screwing or unscrewing the tourniquet.

I have recently put up a fracture in this manner, which occurred at the upper third of the femur to a man of the 13th Hussars, and the coaptation of the injured bone is as perfect as could be desired.



No. 1.—Lower loop of jack-line.
No. 2.—Upper loop of jack-line.
No. 3.—Tourniquet.
No. 4.—Shows jack-line attached to leather loop at the sole of the foot, and passing through notches at the lower extremity of the splint.

APPENDIX No. XX.

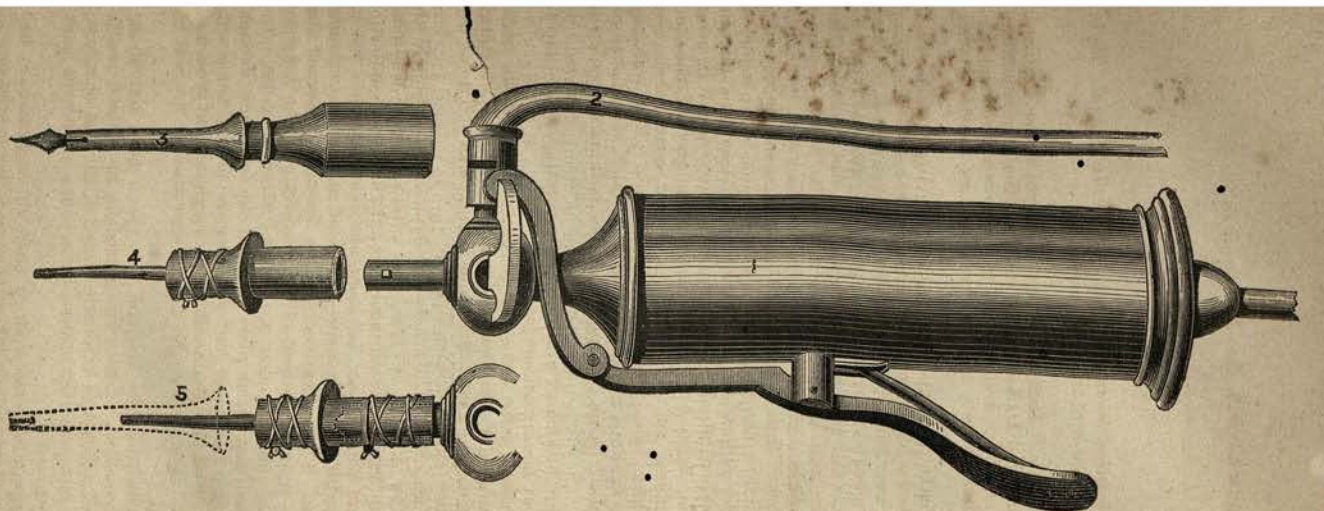
A NEW ADAPTATION OF THE STOMACH-PUMP.

Suggested and practised by Assistant-Surgeon OLIVER, M.D., F.R.C.S.I., 60th Rifles.

THE accompanying figures illustrate a simple contrivance (with which I recently removed 127 ounces of pus from an empyemic patient, whom I was requested to see in consultation) which can be easily constructed any moment in every hospital in the Service, and will be found quite as efficient for removing fluid from the pleura and liver as Bowditch's syringe.

The instrument is thus used :—The front tube of a stomach-pump having been secured to canula No. 4, as delineated in sketch No. 5, the pleura, or liver, is tapped in the usual manner with the largest of the two canulæ, No. 3; the trocar is then withdrawn, and the point of No. 5 canula firmly inserted into No. 3. The pump is now worked as it would be on ordinary occasions to empty the stomach, and the fluid flows away through No. 2 to a basin or other receptacle.

When a sufficient quantitity of fluid has been withdrawn, the point of puncture is seized between the first finger and thumb of the left hand, the canula and pump are removed, and the point of puncture is secured for eight hours by means of needle and twisted suture. When the needle is now withdrawn, the puncture will be found closed. In case it might afterwards re-open carbolic-acid putty on adhesive plaister should be ready prepared for application to the little wound.



No. 1.—The ordinary stomach-pump.

No. 2.—Long stomach-pump tube which conveys off the fluid to any receptacle.

No. 3.—A small canula and trocar (natural size).

No. 4.—A canula, one size smaller than No. 3. and firmly enclosed at its large extremity by a strong caoutchouc tube, which is first passed over and tied on to the canula and then similarly applied to the front tube of the stomach-pump, as delineated in No. 5. This caoutchouc tube should be about 1½ inch long.

APPENDIX No. XXI.

CASES.

1. *Case of Resection for Disunited Fracture treated with Carbolic Acid. By Assistant Surgeon W. Collis, R.H.A.*

R. T., aged 22, belonging to F Battery C Brigade Royal Horse Artillery, sustained a compound comminuted fracture of the lower portion of middle third of the right tibia, by means of a kick from a horse which he was grooming.

He was taken to hospital, when the injury presented the following appearances :—

A contused wound extended an inch longitudinally along the bone, and about one inch and a half across it ; the upper portion of the bone was riding to the extent of two inches over the lower, being also impacted into it to a considerable extent, whilst its spiculated extremity was forcibly pressed outwards, extending the sound skin. On passing the finger into the wound, three fragments of bone about one inch in size could be felt. The fibula was also obliquely fractured, but not comminuted ; little or no bleeding took place, and the patient suffered but slightly from the shock. The fragments being quite detached were removed, a slight enlargement of the wound being found requisite. The patient was placed under chloroform, and extension and counter-extension used, when, after considerable difficulty, the fragments were placed in good position ; the wound was then dressed with carbolic acid (one part of the acid to sixty of sweet oil) and closed up, several layers of lint saturated in the lotion, oiled silk and sheet lead, being used for that purpose. The ordinary tibial splints having been applied and a bandage used, the thigh was flexed on the abdomen, and the leg on the thigh. A mild laxative with an anodyne was then given.

When seen next morning the patient was found to have passed a good night, no constitutional disturbances having taken place.

The case went on favourably, not a bad symptom appearing. On the tenth day the dressings were removed for the first time, when the wound was found entirely healed up, no suppuration whatever having taken place. The injury was then converted into a simple comminuted fracture.

Having left Benares for six months' leave to the hills at this stage, I am personally not aware of the history of the case during those months ; however, a few days after my return, he was again brought under my notice.

I now found that the man whom I had left in an excellent condition was in a very debilitated state of health, in consequence of mental anxiety and extreme pain at the seat of fracture. Upon examination the fracture presented the following appearances :—the upper fragment of tibia overlapped the lower to the extent of about one and a quarter inches, and pressed strongly on the integuments. Complete union had not taken place between the fragments, motion being readily obtained by fixing the upper part of the leg and moving the lower. With regard to the exact state of the fibula some doubts existed, but it seemed almost certain that union had taken place. No deposit surrounding the seat of fracture could be determined.

The man being again admitted into hospital was given good nourishing food, rum being given as a stimulant. Under this treatment his general health very much improved ; but all action had evidently ceased at the seat of injury, and the limb remained, not only perfectly useless, but a source of intense pain and an incumbrance to the patient.

The question of either amputation, resection, or some other procedure, had now to be thought of. I did not find much difficulty in deciding against amputation for the following reasons :—

1st. From the man's position in life, he would be left destitute and unable to get his living.

2nd. Knowing the constitution of the patient, it seemed likely that other and milder means would obviate the adoption of this ulterior one, and at the same time secure to the man a good and useful limb,—besides, as is common with natives, he objected most strongly to have amputation performed.

With reference to the other measures usually adopted to the treatment of disunited fractures, viz., setons, rubbing the ends of the bone together, ivory pegs, &c., the very unfavourable position of the fragments rendered them inapplicable to the present case. Resection of the ends of the bones being thus the only course left open for adoption, was resolved on.

The patient having been placed under the influence of chloroform, I made a longitudinal incision over the seat of fracture along the spine of the tibia, to the extent of about four inches. I also made a cut at right angles to this directly over the protuberance caused by the riding of the fragments: this cut was about two inches and a half in length. The flaps having been dissected back the bone was exposed, and presented the following appearance:—

No surrounding callus existed, although there was some filling up of the interstices caused by the qualities of the fragments. Between the ends of these a considerable amount of callus had been thrown out; this was hard and very firm, but allowed an amount of semi-rotatory motion between the ends of the bones; of these the upper overlapped the lower to the extent of an inch and three-quarters. The extremities of the fragments had become smooth and rounded, and all reparatory action had evidently ceased. The oblique fracture of the fibula was found to be completely united, though an amount of longitudinal displacement existed; the shortening from this cause was, however, not considerable. No callus existed about the seat of this fracture.

The necessary operation was simple. I removed the overriding ends of the tibial fragments, with the included callus, to the extent of about three-quarters of an inch. The space thus formed between the ends of the fragments corresponded to the amount of shortening which had taken place in the fibula. The patient lost but very little blood, neither the anterior nor posterior tibial vessels having been met with.

Ligatures had to be applied to some small vessels—simple torsian was found sufficient for some superficial ones. The wound was allowed to remain for an hour exposed to the air as some oozing had taken place. At the end of this time, the bones having been placed in good position and a few sutures introduced to keep the edges of the wound together, it was thoroughly saturated with carbolic acid lotion of the strength formerly used. Pledgets of lint, saturated with the lotion, were placed on the wound, these again with gutta-percha tissue, the whole being made air-tight by means of oil-silk cloth. The ordinary leg splints having been applied and a flannel bandage having been wrapped round the limb, the whole was kept in position by a bandage applied from the foot to the knee-joint. The thigh was now flexed on the abdomen and the leg on the thigh. Thirty drops of tr. opii was now given him; this quieted him considerably, but did not induce sleep. About 10 P.M. (14 hours after the operation) a similar dose was given, which had the desired effect, and the patient enjoyed a good night's rest.

14th Dec.—Patient very comfortable; complains of but little pain; pulse 104; temperature in axilla 100°; tongue slightly whitish, skin moist; ordered beef tea and dholl (a kind of Indian pulse); a dose of oil was also given.

From this date, up to the 21st of December, nine days after the operation, the condition of the patient continued most satisfactory, the pulse having fallen from 104 to 92, and the temperature of the body from 100° to 99°.

The appetite continued good, and the bowels were opened daily. On this date he complained of some uneasiness about the wound. The dressings having been removed, the longitudinal incision was found completely healed, with the exception of where the sutures interfered. The transverse cut was also nearly healed up, while the space between the ends of the bones was filled up with plastic material.

The ligatures being lose were removed: a very slight trace of pus was found present, resulting evidently from irritation caused by the sutures. The wound was dressed in a similar manner as after the operation.

30th Dec.—On the dressings being removed for the second time, the wound was found to be completely healed up; callus was forming between the ends of the bones most favourably. The general health of the patient is excellent. Wound dressed as before.

29th Jan., 1869.—Patient going on most favourably; callus continues to be thrown out; removed the splints and put on a starch bandage. Patient allowed to go about with the help of crutches.

2. *Case of Obstruction of the Intestines treated by Opium. By Staff Assistant-Surgeon Scanlan, M.B.*

Private R. E., of the 1st Battalion, 4th (King's Own) Royal Regiment, was admitted into hospital on the 19th May, 1869, complaining of pain in the abdomen and constipation of the bowels. The patient is 36 years of age, and has had 13 years and 7 months' service.

The pain was first felt three days before admission, and came on suddenly after dinner. During the two following days he worked hard, as the regiment were removing to other barracks, and he was employed in carrying baggage. When admitted he was slightly feverish, and his bowels had not been properly moved since the time he felt the pain, three days previous to admission. On the 20th May he passed a little at stool, and first noticed that the abdomen was swollen. The pain continued, but it became of a dull aching character, though at first it was intense. Castor oil and then croton oil were given at first, without moving the bowels, and fomentations were applied to the abdomen.

On the 22nd May, three days after admission, the long tube of the stomach-pump was passed into the large intestine, and a large quantity of warm water and castor oil was thrown up; this was retained for some time, and then passed out, without bringing away any fæcal matter or giving permanent relief. The enema was repeated on the evening of the same day with a like result.

On the 23rd May a cantharidis plaister, four inches by five, was placed on the epigastrium where the pain was felt most severely, and two grains of calomel were given every two hours. Patient was placed on low diet when admitted, and six ounces of wine were ordered daily up to the 23rd.

On the 24th May patient was much weaker, and had little rest the night previous. He had not been able to take any food since the day before admission, with the exception of a little beef tea every day, and he was ordered four ounces of brandy instead of the port wine which he had before. The day previous to this he vomited a quantity of green fluid, and felt for a time much relieved by it, but on this day, although he felt a constant inclination to vomit, he was unable to do so. The urine was high coloured and scanty, and, although he felt a constant thirst, he could not drink much, as he would feel painfully distended. The pulse was normal, tongue very foul, and countenance anxious. The fomentations were continued, and the calomel was given, with the addition of half grain doses of opium every two hours.

On the 25th May patient felt easier, but nothing had been passed per anum. The abdomen was enormously distended, though the pain was less severe, and he was much troubled with hiccough. There was no fever, and the pulse was not rapid. The calomel, opium and fomentations were continued, and the long tube of the stomach-pump was again introduced at his own request, as he felt an inclination to go to stool; but, although a large quantity of warm water, oil and soap was thrown up, and retained for quarter of an hour, no fæcal matter passed out.

On the 26th May he was ordered half grain a of opium every two hours, and beef tea enemata, as he was much reduced through want of nourishment, and could not take it into his stomach. He slept none on the previous night, and was evidently becoming much weaker. On three occasions he passed a small quantity of the secretion of the large intestine.

On the 27th May galvanism was applied to the abdomen, one pole being placed on the lower dorsal vertebra, and the other moved gently over the whole surface of the abdomen. He was then placed in a bath and a stream of cold

water was poured from a height down his back, but all these measures failed to relieve the distended state of the intestines. The brandy was increased to eight ounces a day, and the opium continued.

On the 28th May there was no improvement. The beef tea enemata were continued and retained. The pain was still present chiefly in the umbilical region, but the abdomen was not more distended than before. Towards the evening the pain became worse, and he was ordered one grain of opium every hour until it was relieved, and the blistered surface was covered with an extract of aloes. In the morning he passed a great quantity of wind, and felt relieved for a time.

On the 30th May at 3.30 A.M. patient was raised up to the stool and passed about a pint of dark grumous-looking fluid of an offensive odour. He had previously been in great pain, and it was at once relieved. At 5 A.M. he passed about a quart of the same dark matter. The swelling of the abdomen became less, and the pain vanished entirely. During the day he went several times to stool, and the evacuations became gradually more natural and devoid of offensive odour. In the evening he complained of griping pains, which were relieved by hot fomentations.

31st May.—During the night he got up to stool several times, and passed altogether about a gallon of light brown semi-fluid matter, with the natural odour of fæces. He then slept well, and felt much relieved in the morning. The opium was discontinued on the 30th.

Yesterday and to-day he has taken spoon diet, with two pots of extract of meat and two eggs each day, and the brandy has been continued.

1st June.—There is now no tenderness in the abdomen, though it is still flatulent. He now takes his food and feels hungry. The tongue is becoming clean, and the countenance is clearer. He went to stool twice to-day. Is put upon low diet.

2nd June.—Complained of griping pains in bowels and over liver when he takes a long breath. They were relieved by hot fomentations.

Patient continued to improve, and was discharged to duty on the 19th of June perfectly recovered, though feeling rather weak. He afterwards went on sick furlough for six weeks.

Recapitulation.—The disease began suddenly on the 16th May, with an intense pain in abdomen while patient was at stool, and, although he had several slight motions up to the 20th, the bowels were not moved freely until the morning of the 30th May, an interval of 14 days, and for 10 days nothing whatever passed from the bowels, except the secretion of the intestines.

3. *Case of Abscess of the Abdominal Wall. Reported by Surgeon Cullen, 71st Regiment, Curragh.*

THE history of this case, an abscess of the abdominal wall, the result of gonorrhœal buboes, opening into the bladder, and discharging by the urethra for three weeks; then, the mode of exit proving insufficient, requiring external incisions for its relief; and, ultimately, a perfect recovery being afforded after prolonged treatment, appears, from its rarity, worthy of being recorded.

The patient, a robust-looking Scotch recruit, of dark complexion and healthy appearance, contracted gonorrhœa at the Curragh, 14th September, 1868, for which he was seven days under treatment. He was discharged apparently well, but on arrival at Gibraltar in October he was re-admitted for ten days to hospital with a return of his complaint. He was again discharged 1st November, and again made his appearance 8th November with suppurating buboes in both groins, and the urethral discharge as bad as ever.

He denied having exposed himself to any fresh infection from the time of his original admission at the Curragh.

The buboes were incised, but deep sinuses formed, especially in the right groin, and he was 118 days in hospital and 10 days convalescent before he was returned fit for duty with sound cicatrices.

During this prolonged treatment of six months his general health suffered very little.

He now went to drill for a fortnight, but came back to hospital 1st April 1869, complaining of constipation in his bowels, not having had a motion for eight days, and describing a great difficulty in making water from pain in the right iliac and pubic regions.

There was distinct circumscribed swelling and hardness there, and over the bladder a tumour could be felt hard and resistent, much as if a turkey's egg was embedded in the deep tissues. The right groin again showed an open sinus, but this did not extend to any depth, nor was there any surrounding inflammation.

A catheter was passed without difficulty, and clean limpid urine, containing urates and phosphates, was withdrawn.

Fomentation was applied to the pubic region, repeated doses of castor oil and turpentine were administered, an enema was thrown into the rectum, and after a time a mass of dark hard lumpy fæces came away, followed by more natural stools. The following day a dose of calomel, followed by castor oil, brought away more hardened fæces, and, to allay the tendency to flatulency which he exhibited, a few doses of soda and peppermint-water were given.

On the 3rd fomentation by spongio-piline was applied over the vesical region, and on the 4th the bowels were again acted on by means of black draught.

Up to the 15th the fomentation was continued, and the bowels and kidneys acted regularly, microscopic examination of the urine showing urates and phosphates as before. He took a bitter tonic, with acid hydrochloric dil., part of the time.

A blister was applied on the 15th over the region of the tumour, which occupied the right pelvic and adjacent vesical region, and had become denser and more circumscribed. On the evening of the 15th while straining to make water, he noticed that the clean stream of urine changed into a thick whitish turbid one, and that afterwards the prominence of the tumour had materially diminished.

Four ounces of the urine were put aside, and this was found to deposit half an ounce of a white flocculant-looking sediment, which under the microscope proved to be entirely pus.

Up to the end of April the discharge of pus continued, averaging from one to two drachms in 4 oz., and it was observed that the superficial and deeper connective tissues forming the walls of the abscess became gradually matted together. The bowels continued to require a purgative every third day.

On 4th May very few pus cells were observed in the urine, but the abscess had become tenser and fuller. It was punctured with a small trocar and 1½ ounces of pus removed. No air was allowed to enter. The site of the puncture was about 2 inches above the pubes, and 1 inch to right of the middle line. Poultices were applied to the abscess, and he was ordered infusion of quassia with hydrochloric acid.

On the 5th and 6th the puncture was repeated; on the 7th, as the abscess was approaching the surface, an incision was made into it, and 2½ ounces of thin pus removed. He was feverish on this date, but it passed off on taking an alterative of quinine and hydrarg. c. creta.

A pad and bandage were now adjusted over the abscess, which admitted a probe into its cavity for several inches laterally. He was allowed a liberal diet with malt, and in the course of three weeks the amount of discharge had diminished to half an ounce daily. The urine exhibited an extensive deposit of ammoniaco-magnesian phosphates, but no more pus cells were observed after the 7th May.

The closing of the abscess was very gradual, but all the tissues appeared thoroughly consolidated on his discharge 31st July, though some induration still exists in the track of the last open sinus, and there is fulness in the right abdominal wall extending up to the level of the umbilicus.

4. *Case of Amputation through Shoulder-Joint, under the care of Surgeon Porter, 97th Regiment. Reported by Assistant-Surgeon R. E. Bredon, 97th Regiment.*

DRUMMER J. S., 1st Battalion, 4th (King's Own) Royal Regiment, came to hospital on the 7th of July, 1869, complaining of pain and tenderness around the left shoulder-joint, and inability to use the arm. He stated that he had not received any blow or other violence to account for it. He received some local treatment, and was discharged in the evening apparently quite well. On the 9th he returned, with the symptoms he previously presented somewhat aggravated. He again was questioned as to any violence having occurred, and again denied it. A most careful examination for fracture or dislocation was made, but with negative results. The disease was then looked on as of rheumatic origin, a supposition supported by the fact that he complained of some pain in the præcardial region, though there were no stethoscopic signs to indicate the existence of any cardiac disease.

On the 11th the following was noted:—"Very much worse. There is high "fever, rapid pulse, tongue furred, much thirst, restlessness, and some depres- "sion. The upper arm is extensively, and the forearm considerably, swollen, "tense and red. The former is at least four times its natural size. The pain "is very great, and is increased on pressure. It is most marked on the front "of the shoulders. There is very much the appearance of deep-seated inflam- "mation around the joint and bone." Small doses of calomel were prescribed, and the arm, after being scarified freely with a lancet, was wrapped up in a large poultice.

For the next few days the arm remained in pretty much the same state, though the constitutional symptoms became less decided. About the 13th a very erysipelatous-looking blush came over the forearm. A couple of free incisions skin-deep gave him considerable relief, and, under a more generous diet and the use of ammonia and bark, he seemed to be progressing fairly, though the arm continued swollen, and the hand became œdematous in a very marked degree. There was some puffiness of the feet.

On the 20th he is reported "not quite so well." There was much "boggi- ness" on pressure around the forearm, and in this situation on the radial aspect an incision was made which laid open a long sinus from which some thick pus exuded.

The shoulder was at this time much swollen, and apparently the joint contained a good deal of fluid, but no pain or uneasiness was referred to this situation.

21*st*.—The joint was swollen and very puffy looking. An incision was made with a lancet at a point a little above the insertion of the deltoid, and from some depth in the tissues there came out a quantity—ten ounces at least—of thin purulent matter, mixed with cheesy agglomeration. A probe passed through the opening struck bare bone, which was believed to be the neck of the humerus. When the cavity had collapsed after the removal of the fluid, the head of the bone appeared to have passed out of its normal position, and the shoulder had all the appearance of one in which a dislocation of the humerus, downwards, forwards and inwards, had occurred. It was also supposed that complete disorganization of the joint had taken place. In the course of the evening at least twice as much more of the same sort of matter exuded from the opening.

On this day he complained also of some pain and swelling in the right knee-joint, to which accordingly strips of blistering-plaister were applied. There was still a good deal of œdema of the feet, but no albuminaria could be detected.

Late in the evening of this day (21st) it was decided to expose the head of the bone, and to decide the subsequent steps of the operation according to the condition in which it might be found.

On the 22nd, the patient having been placed under chloroform, the joint was examined with a bullet probe, and, as the humerus was found denuded of periosteum for some distance downwards, it was decided that amputation was necessary and excision impracticable.

A flap was made by transfixion from the outer part of the arm, consisting mainly of the deltoid muscle. The bone was then pressed outwards, and the internal flap formed in the usual way. There was no pressure made on the

artery during the operation; but the principal assistant, when it was exposed, followed down the knife with his thumb and compressed it immediately above the point of section. It was then tied immediately. It was now found that only the lower part of the bone had been removed, and that the upper epiphysis still remained attached to the joint. It was then grasped with the lion-tooth forceps and dissected out. Seven arteries in all were tied, and the stump thoroughly washed with cold water. The edges were brought together with silver-wire sutures in the usual way.

After the operation the case proceeded much more favourably than his delicate appearance and low condition at the time of operation led one to expect.

Two ligatures came away on the 28th, three on the 30th, one on the 31st, and the last on the 5th of August. Up to the present date he is progressing most favourably.

A bed-sore on the sacrum has been a most unpleasant complication, but the use of Surgeon Porter's bed-sling prevented its becoming of any great size, and now that he is able to sit up it is healing admirably.

When the arm had been removed it was found that the abscess extended at least 4½ inches down the shaft of the bone, which was quite denuded of periosteum, and was, as stated above, separated from its upper epiphysis. The shoulder-joint was healthy. A considerable abscess had formed around, but did not involve the elbow joint. The whole limb was œdematous, and suppurating sinuses existed in several parts both of the upper and lower arm.

The knee, which at one time gave some grounds for alarm, lest it should take on a similar action to that which manifested itself in the arm, is now much better, though not quite recovered. There is no sign of inflammation or swelling around it.

5. *Case of Aneurism of the Heart, situated at Apex of the Left Ventricle, bursting into the Pericardium, and causing immediate Death. By Staff-Assistant-Surgeon McNalty, M.D., F.R.C.S.I., Devonport.*

Private R. N., ætat 26, a bandsman belonging to the 2nd Battalion Rifle Brigade, of nine years' service, five of which were passed in India, was brought dead to the Military Hospital, Stoke, Devonport, on 21st April, 1868.

History.—His Medical History Sheet shows that he had primary syphilis in 1862, since which period he was admitted into hospital three times for secondary symptoms; he had also been subject to chronic rheumatism.

He was considered a tolerably healthy man, was in the habit of playing the trombone, or some other brass instrument, and was constantly practising. Latterly he had lived pretty freely, but not to the extent of intemperance. On the 16th April, 1868, he felt indisposed, and was excused playing in the band on that day, but did not, however, feel sufficiently ill to seek admission into hospital. On the day preceding the evening of his death, he was subject to much mental emotion. The following account of the circumstances attending his death is furnished by a comrade:—

About 8.20 P.M. on the 21st April, the deceased entered an inn in Devonport, apparently in his usual health. Being offered a glass of ale, he made no reply, but walked over to a table in the room where some men were drinking, and immediately afterwards fell down. He appeared quite insensible, and was taken into the open air, but did not seem to revive; he was then conveyed without delay to the hospital.

There was some delay in making a *post-mortem* examination, owing to the supposition that a coroner's inquest would be held.

Appearances 38 hours after Death.—Body muscular, well nourished, and covered with a considerable amount of fat; scrotum, œdematous; no external marks, with the exception of some old scars, not adherent to the bone, and situated in front of both tibiæ. There was observed to be a want of death-like pallor in the countenance. Rigor mortis moderate.

The circumpallate papillæ of the tongue were somewhat enlarged. The larynx, trachea and larger bronchi were free from disease.

On opening the chest, the lungs were found not to collapse as much as

usual; they were decidedly emphysematous, and were partially congested; pleuræ, healthy. The pericardium was enormously distended, overlapping and pushing aside the left lung. It was much thickened, especially where it embraces the large vessels at base of heart, and contained, at a rough guess, upwards of 20 ozs. of serum, blood and loose, soft coagulæ.

The heart, from pressure, appeared twisted on its long axis, and, from maceration in the contents of the pericardium, was rough on its external surface (not unlike an ox's tongue), from disintegration of the superficial muscular fibres. The organ was very large, flabby, softened in texture, and of a dirty buff colour, and presented at apex a collapsed bag-like appendix which proved to be an aneurismal sac, quite empty, and capable of containing about 3 ozs. of fluid. It communicated with the left ventricle alone by an opening 3½ inches in circumference, surrounded by a thick smooth zone of the muscular fibres composing the "vortex," converted into fatty tissue. This degeneration had extended to the muscular papillares, as they spring from the walls of the ventricles, and was also very evident along the septum ventriculorum. The sac itself was deeply congested in various spots, and so thin that in some places its lining membrane and the pericardium were in direct opposition. The rupture had taken place at a part situated farthest from the apex of the heart, and was so limited in extent that it was not an easy matter to determine its precise seat, the water introduced for this purpose into the sac percolating very slowly through, and appearing more as a weeping, than otherwise, externally; this depended perhaps, in a great measure, on the opening being blocked by the lining membrane of the sac.

The anterior curtain of the mitral valve, at its base, had a whitish appearance, as also had the semi-lunar valves of the aorta (particularly the two posterior), causing a loss of transparency, but no appreciable thickening; the right ventricle was dilated; the tricuspid and semi-lunar valves of the pulmonary artery were normal.

All the heart's cavities were empty; the larger vessels leading to right heart gorged with blood. The aortic arch presented white puckered streaks, as if atheromatous degeneration was commencing; the descending aorta, both thoracic and abdominal, and common iliacs were all healthy.

The liver was congested; the spleen about three times its ordinary size, and very friable—it broke down in the hand while being removed; the kidneys were highly congested; the stomach was distended with gas.

The tissues composing the scalp were congested; the parietal bones presented, on either side of the sagittal suture and near the posterior extremity of the latter, two depressed spots, darker in colour than the surrounding osseous structure, and probably due to syphilitic poison; the brain substance appeared rather anæmic than otherwise; all the intracranial arteries were free from disease; no arcus senitis present.

A microscopical examination of the rough external surface of the heart showed interlacing muscular fibre, and a slice from the thick zone a granular appearance.

Remarks.—The history of the case explains pretty clearly the *post-mortem* appearances. The occupation of the individual causing force, respiratory efforts led to emphysema of the lungs and dilatation of the right ventricle and the inordinate exertion, telling on a diseased heart, resulted in aneurism, which took place, as it generally does, in the left ventricle, which, unprovided with either a safety-valve arrangement or a moderator band to limit overdistension, which exist on the right side, has the hardest work to perform. It occurred also at a part where the disease had made its most rapid strides, and where the walls of the cavity are anatomically weak—at apex, where the superficial muscular fibres curve in. The commencing disease in arch of aorta, and the general tendency to œdipose deposit, are to be taken and conceived as indications of the general malnutrition which existed. The case is remarkable for its comparative rarity. With regard to nomenclature, it would come under the head of true aneurism of the heart—the chronic form, or second variety, described by Rokitansky; it is of peculiar interest to Army Medical Officers, as the relative frequency of heart-disease among soldiers, as compared with the civil population, is a subject at present under consideration. Although there are no signs by which the disease could have been diagnosed with certainty

during life, it is strange that no symptoms were complained of, with the exception of the slight indisposition alluded to.

Professor Aitken, who has very kindly favoured me with a communication with regard to the pathology of the case, is inclined to assign a syphilitic origin to the disease, and the history of the case favours this view; but I would have expected a greater amount of *syphilitic* cachexia to have existed during life, and a "gummatous nodule" to have had a more circumscribed area than the diseased structure had in this case. I may add that an independent examination of the part by an able microscopist showed fatty degeneration of the heart's fibres, and it is very probable that the two agents—syphilis, and morbid nutrition as expressed by fatty degeneration,—both contributed to weaken the heart's walls and cause the aneurism.

6. *Case of Drowning. Reported by Surgeon-Major Webb, M.B., Winchester.*

Hammond's Baths are situated in the meadows near the river at Winchester, a short distance from the town. The soldiers of the 7th Depôt Battalion are marched down to the baths daily in detachments of 150 or 200 men. On the 19th July, the men had only been in the water a short time when a cry was raised that a man was drowning. The man was seen to sink, and great confusion followed. The size of the baths being small, the number of the men great, together with the noise, caused some little delay. The men commenced diving for the body, but unsuccessfully. The drowning man kicked one man, and then shortly afterwards rose to the surface; in doing so, he came in contact with a man diving to rescue him; he encircled his arm around this man's neck, and they went down together; the man who was thus dragged down put up his arm for help, it was seen and seized, and he was dragged out in an exhausted state. The men were now urged to continue diving, which they *did* for two or three minutes; but, owing to the very muddy state of the water, they could not find the body.

The precise time occupied in diving for the body is most important, but very difficult to estimate. The officers and five men, who were most urgent in their endeavours to save the man, agree with me in thinking two or three minutes elapsed. The remarks of the men, "He must be dead long before this," go to show the probability of two or three minutes' submersion.

A man, Private Green, 3rd Rifle Brigade, now volunteered to recover the body. Stripping off his clothes, he most courageously dived, reached the body, but failed to bring it up. He then took breath and dived again; this time he seized the leg, drew the body under water to the bank-side, seized the bank with his other hand, and directly he was seen a rush was made, and both were pulled up the bank.

Being an eye-witness of the whole, the determination, resolution, and courage of Private Green are beyond all praise, and struck me as an act of noble devotion to save a fellow creature.

Unfortunately the men and the body were on the opposite side of the baths to myself. Having called upon the men to rub the body, I ran round the head of the bath and on to the meadows, but found myself and Captain Knox cut off from the drowned man by a large muddy impassable ditch. Returning, we ran round below, and had to jump two large and several small ditches, and a distance of high meadow grass. Then a heavy thorn fence to keep out intruders had to be climbed: with great difficulty I got on the top of the fence, and jumped down amongst the men.

This detail is all-important. The time occupied in going round, jumping ditches, and getting over the high fence, Captain Knox and myself think occupied two or three minutes.

The work of resuscitation now commenced. There were no signs of life: the body was livid and cold, the face and neck black, eyes all but closed and fixed, jaws rigid and fixed. The Sylvester process was now used—seizing the wrists and elevating the arms high above the head, putting the pectoral muscles well on the stretch, and endeavouring to the utmost to increase the distension of the chest; the arms were then relaxed and, falling on the chest,

firm pressure was applied on either side of the chest to expel every particle of air.

During the first two or three distensive motions, a gurgling tracheal râle or rattle was audible, which sound soon extended to both sides of the thorax. It was very distinct, resembling, in every respect, the passage of air through water—a bubbling, gurgling noise.

The resuscitation, as above, went on for the first quarter of an hour with little or no result, as far as external signs went. I endeavoured to imitate ordinary respiration, and to limit the number of artificial respirations per minute, as far as I was able. At the extreme elevation of the arms, when the capacity of the thorax was at its highest point, a few seconds were allowed to elapse before gradually relaxing the chest muscles; firm and steady pressure, to compress the whole of the chest and expel air, followed; then a small interval, and the elevation process recommenced. During the whole of this time, six or eight men were rubbing and drying the body, cleaning the mouth and nose, &c., in a most energetic manner; their flannel shirts were used to form a pillow for the head, which was only slightly raised, and also to rub the body with.

Whilst resuscitating, I gave directions to these men, urging them to save the life of their comrade; and the assiduous flannel friction and hand-rubbing were most praiseworthy.

During the second quarter of an hour (the exact time cannot be given), whilst watching the chest, a spasmodic, short kind of inspiration now and then became observable, at first of a very doubtful character; after some minutes, more clearly developed. It appeared as if the respiratory actions were commencing in short portions. The resuscitation was, however, continued, and these symptoms not depended on.

About the end of the first half hour, the strength of these respiratory efforts were manifestly improving. During the next quarter of an hour they were so far improved as to induce me to venture to relax the artificial process; but *in an instant* it was evident they were of little strength, and not to be relied on.

About this time the first indication of movement occurred. It was with the greatest pleasure and deepest interest, after watching the body upwards of half an hour, I saw *the right upper eyelid* raised a very little, and only for a second, and in a few minutes afterwards the left upper eyelid moved.

The exertions of the men were now redoubled; every one had hopes; the skin had lost its cold dingy character, the face became clearer and lighter, and then a small temporary movement of both eyeballs followed.

In the next quarter of an hour, the respiratory efforts became stronger; but still very short, convulsive, or spasmodic in character.

At the expiration of an hour, re-animation was fairly established: the face had lost its lividity, the lips were assuming a natural rosy tint, the jaws were unlocked, the skin had some warmth; he could be roused by loud talking, but could not speak.

Exhausted by the exertion, I left the Sylvester process and tried the side-to-side rolling process; he rapidly became worse, and the Sylvester process was resumed by a non-commissioned officer under my instructions.

Even at this time the man's condition was critical. On relaxing the process, to see if nature could carry on respiration, he went back; the head fell, and the eyes became closed.

Brandy having been obtained with great difficulty, he swallowed about a drachm, but it revived him.

Blankets and hot water were at hand, but the extremities were still very cold. The water was very hot, and not having had a good full inspiration as yet, I poured the hot water rapidly over his feet and legs; it had the desired effect; a scream and a fine full inspiration followed.

During the third half hour he commenced to speak; but the oppression of the breathing, the drowsiness, and the râles in his throat and thorax indicated mischief.

When the circulation was fully established, he took a little more brandy, was wrapped up in blankets, and then carried to barracks.

On his arrival his condition again became alarming: the oppression in his

chest, the difficulty of breathing, and the lividity of his hands and face, again appeared. A warm bath, stimulants, and mustard sinapisms rallied him; he became warm and perspired freely. The respiration, however, did not improve, and the pulse was rapid and feeble.

The obstructions to the pulmonary circulation were very evident; the face was congested, and the nails and fingers livid.

During the next 12 hours (the accident occurred at 4 P.M. in the afternoon) he dozed a little, and answered questions better. The improvement, however, was of short duration: the symptoms now were aggravated, the heart laboured, the pulse was galloping and feeble, the râles increasing, the pulmonary congestion urgent, and he died 26 hours after his accident.

The *post-mortem* revealed great pulmonary congestion, dirty-looking water in the larger bronchi, and a mottled emphysematous appearance externally of the lungs.

The larynx and adjoining parts were congested and swollen; effusion at the base of brain, and a remarkable gorged distended state of the lateral sinuses, also presented.

The chief interest in this case is the *time* this man was submersed, and it is necessary to speak with due caution and careful consideration. The actual submersion, Captain Knox, in his Report to the Royal Humane Society, has stated from *three* to *five* minutes—in my Report to the Society I gave five minutes, or about five minutes; but the evidence of the five men who were near the drowning man gives five minutes as the probable time, and even Captain Knox informed me it might have been five minutes. However, taking four minutes, the submersion is one of the longest on record in which resuscitation has followed.

7. *Case of Sudden Death in Typhoid Fever. By Assistant-Surgeon Boileau, M.B., 29th Regiment, Canada.*

Private G. P., aged 23, and having completed a service of 7 years, was admitted into hospital on the third day of the fever. On the fourth I recorded an unusual weakness of the cardiac systole. He progressed most favourably until the thirteenth morning, having all the usual symptoms of the disease, which appeared to be of a mild but decided type. The only medicine administered was 10 grains of the bicarbonate of soda in 2 drachms of the tincture of gentian, which he took three times daily. On the day preceding his death, this medicine was omitted, and 10 grains of compound kino-powder substituted. From 5 to 10 ounces of wine, with 2 pints of beef-tea, were given to him daily.

Up to the moment that he expired, there was not a sign or symptom to warrant an unfavourable prognosis.

Fortunately, for my own satisfaction, I had given to the patient himself, and to his attendants, the most precise directions that not for any purpose whatever was he to sit up in bed, but that he was to remain in the recumbent position. Unfortunately this injunction was unheeded by the patient, who, while in the act of sitting up in bed about 2 o'clock in the afternoon, to take a drink, fell backwards and at once expired.

I made a most careful *post-mortem* examination, and found nothing to account for death; the brain, lungs, heart, liver, spleen, kidneys, being apparently healthy. In the right side of the heart, a fibrinous clot extended from auricle to ventricle, almost including the tricuspid orifice; the left side was almost empty. Peyer's glands were much congested, indurated, and raised above the level of the surrounding mucous membrane, but there was no appearance of ulceration. Stomach and colon healthy.

Such untoward events as these appear to be analogous to the many recorded cases of sudden and unaccountable death after labour. In most of them, no information of any practical worth has been obtained by an autopsy. Paralysis of the heart is supposed to be the cause of death, and this seems to be a rational explanation. I expressed this opinion at the time of the occurrence, but it was objected to on the ground that, if paralysis of the heart was the cause of death, then the cavities would have been found distended with blood. I am

not aware, however, of this having been proved. Nearly every recorded death of this kind has occurred at the moment of some sudden exertion on the part of the invalid, some effort which withdrew the aid of gravity from the weakened heart's propelling power. Does it not appear to be a reasonable assumption, that the sudden anæmia of nervous centres, likely to be produced, would lead to paralysis of the heart—of a heart propelling blood of impaired quality and reduced in quantity, the blood of a patient thirteen days prostrated by typhoid poison?

The practical lesson to be learnt from such a case is the necessity of investigating the condition of the heart in fevers, and of impressing on patient and attendants the danger of any movements calculated to overtax it, when its condition of exhaustion is evidenced by our examination.

8. *Remarkable Case of Alopecia, the Result of Cerebral Injury. By R. Cooper Todd, A.B., Staff-Surgeon.*

ALOPECIA, partial and complete, is often the result of special dyscrasiæ, or zymotic diseases. It has followed parturition, and in fact any influence producing cachexia. It is, however, generally regarded as a manifestation of syphilitic infection, and some have blamed the exhibition of mercury for the baldness.

In such cases, however, the loss of hair is mostly partial, and it is confined to the scalp. It is also generally slowly progressive, extending over a few weeks, or even months; and the patients are apt to recover as the cachectic state passes away.

In the case about to be recorded, however, the loss of hair was general, and took place, when it began, at once. The patient was a strong, healthy, hirsute man in the prime of life, and free from any scrofulous or syphilitic taint. The alopæcia came on, it is true, some time after the cerebral injury, and after the exhibition of both mercury and the bromide of potassium, yet it can scarcely be doubted that the history of the case, particularly when compared with that of another similar one, points to some nervous influence as the cause of baldness.

It may be well to mention that the original cerebral injury was treated on the expectant principle, nourishment and even stimulants being cautiously administered. The exhibition of mercury was proposed by that distinguished practitioner, the late Dr. Hutton, whose valuable aid I had solicited, but the medicine was not administered, in deference to my opposition; and it is curious to relate that the very first serious symptoms in the case followed the action of two mercurial purgative pills, taken without advice by the patient himself.

It is thought that the unique character of the case justifies the hope that it is worthy of a place among the recorded cases in the Army Medical Report, although the case *per se* has already appeared in the pages of the "Lancet."

In the summer of 1863 I was called to see a gentleman, aged about 45, at a hotel in Bray, Ireland, who had been thrown from the side of an Irish car upon his head, and received a partial concussion of the brain. Immediately after the accident he was quite master of himself, and able to continue his journey until he reached the hotel, which was about 4 miles from the site of the accident. When I saw him he was slightly confused in mind, but perfectly able to answer questions, and conscious of the passing events. By my advice he remained that night in the hotel; but the next morning, before I had time to visit him, he had left the hotel and returned to his home in Dublin, a distance of quite 12 miles, which he accomplished by rail and by cabs. In the course of the following day, and for a few days after, some alarming symptoms supervened. Hemiplegic convulsions of an epileptiform character came on, accompanied by total unconsciousness; but the fits were of short duration, and in the interim the patient was collected. There was, however, present at times a peculiar kind of delirium, like that common in some low fevers. The patient rose from bed, seemed anxious to hide away and lock up in his chest of drawers trifling articles, such as a grape or two, and on one occasion he tried hard to throw himself out of his window; but at the same

time, when addressed, he was quite amenable to government, and recognized those about him. In a short time he quite recovered, and in less than six weeks, I think, after the accident managed successfully some very important private business.

However, in the course of time, he suffered, as he stated himself to me afterwards, from occasional headaches, and he sought medical advice, I think, in Scotland. He then underwent a course of mercury, and subsequently took daily, for about twelve months as I understood him to say, 30 grains of the bromide of potassium, when he found that one morning, on proceeding to shave, he had no beard to cut; and subsequently and rapidly all his hair fell out, not only from his head and face, but from his chest and body, and up to this time he had been, as I have said, a very hirsute man.

This peculiar result of the accident was brought to my notice only the other day (1869) by the gentleman himself. He was then in excellent health, but perfectly free from any trace of hair. He stated that his taste and smell were not quite so good as they used to be, but that in every other respect he was quite well and hearty, and that he had never had any approach to any epileptiform seizure since the first attack.

At first I was very much disposed to regard the alopecia as the result of the action of the bromide of potassium. This idea was strengthened by considering the effect which the continued use of the iodide has been known to have upon the testes in males and upon the breasts in females. I gave up this idea, however, on reading the report of a case, similar at least as far as the loss of hair goes, alluded to in Holmes's "System of Surgery," article "Accidents from Lightning," which was pointed out to me by my friend, Dr. H. Massey. In both cases the baldness followed nervous shock. In the one mentioned by Mr. Holmes, the depilation began the day after the accident, which was a lightning stroke. The patient was a naval captain, and during a thunderstorm he was knocked down by lightning, and the very next day the hair fell off from all his body. In the following year the finger-nails (wrongly printed in the "Lancet" "toe-nails") "scaled away," those of the toes experiencing no visible change.

As it is quite clear that the alopecia was not the effect of treatment in the case recorded in Mr. Holmes's "Surgery," so I think it may be fairly inferred that the baldness in the case of my friend resulted from cerebral injury, and not from the subsequent treatment.

APPENDIX No. XXII.

ON THE COMPARATIVE USE OF CERTAIN DRUGS IN THE ARMY AT HOME.

A TABLE was published in the last volume of these Reports (page 432) showing the quantities of certain medicines used by a number of corps serving at home during the year 1867-8, and some remarks were appended pointing out the object of its publication.

It is not practicable to give the expenditure of exactly the same regiments in this year's volume, as some of them have been removed to foreign stations, and others so broken up as to render the returns unserviceable for the purpose.

It is hoped that some advantage will be derived from an examination of these Tables, especially in the direction of economy in the expenditure of drugs, which do not seem to be really essential in the treatment of disease in military hospitals. (*See* strength, sickness, and mortality in these corps in the statistical portions of this volume.)

APPENDIX No. XXIII.

THE ARMY MEDICO-CHIRURGICAL SOCIETY OF PORTSMOUTH.

ABSTRACT of the Proceedings of the Medico-Chirurgical Society of Portsmouth, with Notes of the Papers read before the Society from July 1868 to August 1869, continued from page 637, vol. viii., of the "Army Medical Reports."

Reported by the Secretary, Staff Assistant-Surgeon E. F. O'LEARY.

AT the meeting held at the Garrison Hospital, Portsea, on July 1st, after the meeting had been opened by the President, the notes of a case of sudden death were read by Dr. Poulton, 35th Regiment. The man was a soldier of the 35th Regiment, and was engaged, at the time of his decease, in running drill. The cause of his death was found to be the bursting of a small aneurism, about the size of a hazel-nut, into the pericardium. He had, when stationed at Chatham as a recruit in 1859, been treated for cardiac affection; he then embarked for India, whence he only returned in January 1868, and where, on one occasion only, he suffered from rheumatism; but the presence of organic disease of the heart or large blood-vessels was not suspected up to the period of his death.

A paper by Assistant-Surgeon Bredin, 97th Regiment, was then read by Assistant-Surgeon Maunsell, R.A., for the author. The subject was a history of a case of aneurism of the thoracic aorta. The man was a soldier of the 97th Regiment, and was about 38 years old, though having only 9 years' service. He had suffered severely from malarial fever in India, and had had syphilis; but at the time of his death showed no external marks of constitutional taint. The symptoms of the disease were first noticed at the Volunteer Review, when he felt a peculiar oppression in the chest after "doubling." It passed away, and he thought no more about it. Ten days afterwards cough set in, and he began to expectorate white viscid mucus. He complained of constriction across the upper part of the chest; his breathing was croupous, and his cough loud and ringing; loud sonorous râles were heard over both lungs, and the case was entered as bronchitis. The superficial veins of the neck and chest were much congested, and he complained of much pain over the upper part of the sternum. An aneurismal tumour was strongly suspected, but the stethoscope did not reveal any marked signs of the disease. He shortly afterwards began to suffer from acute pain shooting up the right side of the neck, and also between the shoulders. Attacks of dyspnœa next showed themselves, and became so severe as to threaten suffocation. After recovering apparently

TABLE showing the quantities of certain MEDICINES used by the following Corps serving at Home during the Year 1868-9.

Strength . .	1st Life Guards.	2nd Life Guards.	Royal Horse Guards.	4th Drag. Guards.	7th Drag. Guards.	8th Drag.	9th Lancers.	15th Hussars.	17th Lancers.	2 Batts. Grenr. Guards.	2 Batts. Coldm. Guards.	3 Batts. Scots Fus. Guards.	3 Batts. F. Gds.	3rd Regt.	1st Bat. 3rd Regt.	2d Bat. 3rd Regt.	7th Regt.	1st Bat. 23rd Regt.	2d Bat. 23rd Regt.	1st Bat. 24th Regt.	2d Bat. 24th Regt.	42nd Regt.	60th Rifles.	63rd Regt.	69th Regt.	6th Batt. Royal Regt. Artillery.	Cavalry Depot.	10th Batt. Royal Regt. Artillery.	5th Regt.	5th Regt. Royal Irish.	7th Regt. Royal Fusiliers.	8th Regt.	9th Regt.	13th Batt. Royal Regt. Artillery.	Strength . .
	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	
Acacia Gummi	2 0	1 0		1 0	1 0	1 2	1 8	1 0	1 0	0 12	0 8	0 8	0 8	0 8	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 14	0 8	0 8	0 8	0 8	0 8	0 8	0 8	0 8	0 8	0 8	0 8	0 14	Acacia Gummi
——— (powder)	0 4	0 2		0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	——— (powder)
Acidum Aceticum	6 0	5 0	1 8	0 8	1 10	2 8	2 8	1 8	0 14	0 8	0 8	0 8	0 8	0 8	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4	1 4	0 8	0 8	0 8	0 8	0 8	2 12	0 8	0 8	0 8	0 8	1 12	Acidum Aceticum
——— Hydrochloricum	0 8	0 8	0 12	0 6	0 8	1 0	1 0	0 8	0 6	0 4	0 4	0 4	0 4	0 4	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 6	0 4	0 4	0 4	0 4	0 4	1 8	0 4	0 4	0 4	0 4	0 6	——— Hydrochloricum
——— Hydrocyan. dil.	0 1	0 2	0 2	0 1	0 2	0 2	0 2	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 2	0 2	0 2	0 2	0 2	0 2	0 12	0 2	0 2	0 2	0 2	0 2	——— Hydrocyan. dil.
——— Nitrosum	0 0	1 0	0 4	0 2	0 4	0 4	0 4	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 4	0 2	0 2	0 2	0 2	0 2	1 0	0 2	0 2	0 2	0 2	0 2	——— Nitrosum
——— Sulphuricum		1 0	0 4	0 2	0 4	0 4	0 4	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 4	0 2	0 2	0 2	0 2	0 2	1 0	0 2	0 2	0 2	0 2	0 2	——— Sulphuricum
——— Tannicum			0 2	0 1		0 2	0 2																0 2						0 8						——— Tannicum
——— Tartaricum	0 0	0 2	0 2	0 1	0 2	0 2	0 2	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 2	0 2	0 2	0 2	0 2	0 2	0 8	0 2	0 2	0 2	0 2	0 2	——— Tartaricum
Aloe	0 6	0 2	0 0	0 2	1 7	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 2	0 2	0 2	0 2	0 2	0 2	0 8	0 2	0 2	0 2	0 2	0 2	Aloe
Aloes et Myrrhæ Pulvis	0 6	0 2	0 0	0 2	1 7	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 2	0 2	0 2	0 2	0 2	0 2	0 8	0 2	0 2	0 2	0 2	0 2	Aloes et Myrrhæ Pulvis
Ammoniæ Chloridum	0 12	0 6		0 4	1 4	0 4		0 4	0 4	0 12	0 8	0 8	0 8	0 8	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 11	0 8	0 8	0 8	0 8	0 8	1 12	0 8	0 8	0 8	0 8	0 8	Ammoniæ Chloridum
Ammoniæ Sesquicarb.	0 12	0 6		0 4	1 4	0 4		0 4	0 4	0 12	0 8	0 8	0 8	0 8	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 11	0 8	0 8	0 8	0 8	0 8	1 12	0 8	0 8	0 8	0 8	0 8	Ammoniæ Sesquicarb.
Amylum	1 8	0 8		0 4	1 4	0 4	0 4	0 4	0 4	0 12	0 8	0 8	0 8	0 8	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 11	0 8	0 8	0 8	0 8	0 8	1 12	0 8	0 8	0 8	0 8	0 8	Amylum
Antimonium Tartarizatum			0 2	0 1	0 2	0 2	0 2			0 2	0 2	0 2	0 2	0 2	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 2	0 2	0 2	0 2	0 2	0 2	0 8	0 2	0 2	0 2	0 2	0 2	Antimonium Tartarizatum
Aq. destillata	0 0	12 0	20 0	0 8	2 0	0 8	0 8	0 8	0 8	0 8	0 8	0 8	0 8	0 8	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4	1 0	0 8	0 8	0 8	0 8	0 8	2 0	0 8	0 8	0 8	0 8	0 8	Aq. destillata
Argenti Nitras	0 14	0 8		0 4	1 4	0 4	0 4	0 4	0 4	0 2	0 2	0 2	0 2	0 2	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 3	0 2	0 2	0 2	0 2	0 2	0 13	0 2	0 2	0 2	0 2	0 2	Argenti Nitras
Bismuthum Purificatum			0 1		0 2	0 1	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 2	0 2	0 2	0 2	0 2	0 2	0 12	0 2	0 2	0 2	0 2	0 2	Bismuthum Purificatum
Blistering Tissue	Yards																																		Blistering Tissue
Borax		1 4	0 2	0 1	0 2	1 12	1 12	0 4		0 2	0 2	0 2	0 2	1 12	0 10	0 8	1 0	0 8	0 8	0 8	0 8	0 8		0 8	0 8	0 8	0 8	0 8	2 0	0 8	0 8	0 8	0 8	0 8	Borax
[Calomelas] Hydrargyri Subchlor.	0 4	0 6	0 12	0 1	0 2	0 2	0 2	0 2	0 2	1 10	0 12	0 8	0 8	0 8	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 12	0 8	0 8	0 8	0 8	0 8	1 0	0 8	0 8	0 8	0 8	0 8	[Calomelas] Hydrargyri Subchlor.
Calumbæ Radix	0 14	0 8		0 4	1 4	0 4	0 4	0 4	0 4	0 12	0 8	0 8	0 8	0 8	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 11	0 8	0 8	0 8	0 8	0 8	1 12	0 8	0 8	0 8	0 8	0 8	Calumbæ Radix
Camphora	0 12	2 8	0 4	0 7	0 14	0 10	0 12		0 12	1 0	1 0	1 0	1 0	1 0	0 8	0 8	0 8	0 8	0 8	0 8	0 8	0 8	0 9	0 6	0 6	0 6	0 14	0 10	1 7	0 6	0 6	0 6	0 6	0 11	Camphora
Cataplasma	0 4				0 8																		0 6						0 14						Cataplasma
Chloroformum	1 12	0 3	0 2	1 0	0 4	1 2	0 12	0 2	0 12	0 12	0 12	0 12	0 12	0 12	0 6	0 6	0 6	0 6	0 6	0 6	0 6	0 6	0 10	0 6	0 6	0 6	0 6	0 6	1 4	0 6	0 6	0 6	0 6	0 6	Chloroformum
Colchicum	0 4	0 1	0 8	0 0	0 4	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 3	0 2	0 2	0 2	0 2	0 2	0 8	0 2	0 2	0 2	0 2	0 2	Colchicum
——— vinum											0 4																								——— vinum
Confectio Rosæ Gallicæ			0 2	0 2	0 4	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 2	0 2	0 2	0 2	0 2	0 2	0 8	0 2	0 2	0 2	0 2	0 2	Confectio Rosæ Gallicæ
Copaiba			0 2	0 2	0 4	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 2	0 2	0 2	0 2	0 2	0 2	0 8	0 2	0 2	0 2	0 2	0 2	Copaiba
Cosmetum											0 8	0 8	0 8	0 8	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 2	0 2	0 2	0 2	0 2	0 8	0 2	0 2	0 2	0 2	0 2	Cosmetum
Cubebæ	0 0	1 0	0 4	0 2	0 4	0 4	0 4	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 4	0 2	0 2	0 2	0 2	0 2	1 0	0 2	0 2	0 2	0 2	0 2	Cubebæ
Cupri Sulphas					0 1	0 1	0 0	0 1															0 2						0 8						Cupri Sulphas
Digitalis Folia						0 0	0 1																	0 2						0 2					Digitalis Folia
Emplastrum Cantharidis	0 8			0 2	1 8	0 12		1 8	1 8	1 0	0 8		1 0	0 8	1 0	0 8		1 0	0 8		1 0	0 8	0 12	1 0	0 8	0 8	3 12	1 8	4 8	2 8	0 8	4 0	2 8	1 0	Emplastrum Cantharidis
——— Resinæ					0 2	0 1	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 2	0 2	0 2	0 2	0 2	0 2	0 8	0 2	0 2	0 2	0 2	0 2	——— Resinæ
Extractum Belladonnæ	0 2			0 1	0 2	0 1	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 2	0 2	0 2	0 2	0 2	0 2	0 8	0 2	0 2	0 2	0 2	0 2	Extractum Belladonnæ
——— Colchic. Aceticum	0 2			0 1	0 2	0 1	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 2	0 2	0 2	0 2	0 2	0 2	0 8	0 2	0 2	0 2	0 2	0 2	——— Colchic. Aceticum
——— Colocynth. comp.	0 8	0 12		0 2	0 4	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 2	0 2	0 2	0 2	0 2	0 2	0 8	0 2	0 2	0 2	0 2	0 2	——— Colocynth. comp.
——— Conii	0 2	0 1	0 2	0 1		0 2	0 1			0 2	0 2	0 2	0 2	0 2	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 2	0 1	0 1	0 1	0 1	0 1	0 8	0 1	0 1	0 1	0 1	0 1	——— Conii
——— Hyoscyami	0 2	0 2	0 2	0 1	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 2	0 2	0 2	0 2	0 2	0 2	0 8	0 2	0 2	0 2	0 2	0 2	——— Hyoscyami
——— Opii			0 2	0 1		0 2	0 2																0 2						0 8						——— Opii
——— Sarsæ Liquidum	1 0			0 4	2 0	0 8	0 8	0 8	0 8	0 8	0 8	0 8	0 8	0 8	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 11	0 8	0 8	0 8	0 8	0 8	1 12	0 8	0 8	0 8	0 8	0 8	——— Sarsæ Liquidum
Ferri et Ammoniæ Citras	0 4	0 2			0 11	0 3	0 4	0 4	0	0 8	0 8	0 8	0 8	0 8	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4							0 2	0 7		0 4	0 4	0 4	0 4		Ferri et Ammoniæ Citras
—— et Quininæ Citras	0 4	1 0	0 8	0 2	0 14	0 3	0 4	0	0	0 10	0 10	0 10	0 10	0 10	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4							0 2	0 7		0 4	0 4	0 4	0 4		—— et Quininæ Citras
——— Sulphas		0 12	0 12	0 1	0 14	0 4	0 4	0 2	0 2	0 6	0 6	0 6	0 6	0 6	0 3	0 3	0 3	0 3	0 3	0 3	0 3	0 3	0 11	0 6	0 6	0 6	0 6	0 6	0 14	0 6	0 6	0 6	0 6	0 6	——— Sulphas
Galla					0 4																		0 6						0 14						Galla
Glycerinum	0 6	0 2	0 2	0 1	0 14	0 3	0 2	0 2	0 2	0 4	0 4	0 4	0 4	0 4	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 5	0 4	0 4	0 4	0 4	0 4	0 12	0 4	0 4	0 4	0 4	0 4	Glycerinum
Guaiaci Lignum																							0 4						0 10						Guaiaci Lignum
Hydrargyri Perchloridum	0 0			0 0	0 0	0 0	0 0																												Hydrargyri Perchloridum
Hydrargyri Pilulæ	0 4	0 8	0 2	0 2	0 4	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 2	0 2	0 2	0 2	0 2	0 2	0 8	0 2	0 2	0 2	0 2	0 2	Hydrargyri Pilulæ
Hydrargyri Oxidum Rubrum		0 14			0 14	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 3	0 2	0 2	0 2	0 2	0 2	0 12	0 2	0 2	0 2	0 2	0 2	Hydrargyri Oxidum Rubrum
——— Iodidum Viride																																			——— Iodidum Viride

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TABLE showing the quantities of certain MEDICINES used by the following Corps serving at Home during the year 1868-9—*continued.*

| Strength | 1st Life Guards | 2nd Life Guards | Royal Horse Guards | 4th Drag. Guards | 7th Drag. Guards | 6th Drags. | 8th Hussars | 13th Hussars | 17th Lancers | 1 Batt. Coldstream Guards | 2 Batts. Scots Fusiliers | 3 Batts. Grenadier Guards | 1 Batt. 3rd Regt. | 1 Batt. 4th Regt. | 1 Batt. 5th Regt. | 2 Batts. 7th Regt. | 1 Batt. 9th Regt. | 2 Batts. 10th Regt. | 1 Batt. 11th Regt. | 2 Batts. 12th Regt. | 1 Batt. 14th Regt. | 2 Batts. 15th Regt. | 2 Batts. 18th Regt. | 2 Batts. 19th Regt. | 2 Batts. 20th Regt. | 2 Batts. 23rd Regt. | 2 Batts. 24th Regt. | 2 Batts. 25th Regt. | 2 Batts. 27th Regt. | 2 Batts. 28th Regt. | 2 Batts. 29th Regt. | 2 Batts. 30th Regt. | 2 Batts. 31st Regt. | 2 Batts. 33rd Regt. | 2 Batts. 34th Regt. | 2 Batts. 35th Regt. | 2 Batts. 36th Regt. | 2 Batts. 37th Regt. | 2 Batts. 38th Regt. | 2 Batts. 39th Regt. | 2 Batts. 40th Regt. | 2 Batts. 41st Regt. | 2 Batts. 42nd Regt. | 2 Batts. 43rd Regt. | 2 Batts. 44th Regt. | 2 Batts. 45th Regt. | 2 Batts. 46th Regt. | 2 Batts. 48th Regt. | 2 Batts. 49th Regt. | 2 Batts. 50th Regt. | 2 Batts. 52nd Regt. | 2 Batts. 53rd Regt. | 2 Batts. 54th Regt. | 2 Batts. 55th Regt. | 2 Batts. 57th Regt. | 2 Batts. 58th Regt. | 2 Batts. 59th Regt. | 2 Batts. 60th Regt. | 2 Batts. 61st Regt. | 2 Batts. 62nd Regt. | 2 Batts. 63rd Regt. | 2 Batts. 64th Regt. | 2 Batts. 65th Regt. | 2 Batts. 66th Regt. | 2 Batts. 68th Regt. | 2 Batts. 69th Regt. | 2 Batts. 70th Regt. | 2 Batts. 71st Regt. | 2 Batts. 72nd Regt. | 2 Batts. 73rd Regt. | 2 Batts. 74th Regt. | 2 Batts. 75th Regt. | 2 Batts. 76th Regt. | 2 Batts. 77th Regt. | 2 Batts. 78th Regt. | 2 Batts. 79th Regt. | 2 Batts. 80th Regt. | 2 Batts. 81st Regt. | 2 Batts. 82nd Regt. | 2 Batts. 83rd Regt. | 2 Batts. 84th Regt. | 2 Batts. 85th Regt. | 2 Batts. 86th Regt. | 2 Batts. 87th Regt. | 2 Batts. 88th Regt. | 2 Batts. 89th Regt. | 2 Batts. 90th Regt. | 2 Batts. 91st Regt. | 2 Batts. 92nd Regt. | 2 Batts. 93rd Regt. | 2 Batts. 94th Regt. | 2 Batts. 95th Regt. | 2 Batts. 96th Regt. | 2 Batts. 97th Regt. | 2 Batts. 98th Regt. | 2 Batts. 99th Regt. | 2 Batts. 100th Regt. | 2 Batts. 101st Regt. | 2 Batts. 102nd Regt. | 2 Batts. 103rd Regt. | 2 Batts. 104th Regt. | 2 Batts. 105th Regt. | 2 Batts. 106th Regt. | 2 Batts. 107th Regt. | 2 Batts. 108th Regt. | 2 Batts. 109th Regt. | 2 Batts. 110th Regt. | 2 Batts. 111th Regt. | 2 Batts. 112th Regt. | 2 Batts. 113th Regt. | 2 Batts. 114th Regt. | 2 Batts. 115th Regt. | 2 Batts. 116th Regt. | 2 Batts. 117th Regt. | 2 Batts. 118th Regt. | 2 Batts. 119th Regt. | 2 Batts. 120th Regt. | 2 Batts. 121st Regt. | 2 Batts. 122nd Regt. | 2 Batts. 123rd Regt. | 2 Batts. 124th Regt. | 2 Batts. 125th Regt. | 2 Batts. 126th Regt. | 2 Batts. 127th Regt. | 2 Batts. 128th Regt. | 2 Batts. 129th Regt. | 2 Batts. 130th Regt. | 2 Batts. 131st Regt. | 2 Batts. 132nd Regt. | 2 Batts. 133rd Regt. | 2 Batts. 134th Regt. | 2 Batts. 135th Regt. | 2 Batts. 136th Regt. | 2 Batts. 137th Regt. | 2 Batts. 138th Regt. | 2 Batts. 139th Regt. | 2 Batts. 140th Regt. | 2 Batts. 141st Regt. | 2 Batts. 142nd Regt. | 2 Batts. 143rd Regt. | 2 Batts. 144th Regt. | 2 Batts. 145th Regt. | 2 Batts. 146th Regt. | 2 Batts. 147th Regt. | 2 Batts. 148th Regt. | 2 Batts. 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932nd Regt. | 2 Batts. 933rd Regt. | 2 Batts. 934th Regt. | 2 Batts. 935th Regt. | 2 Batts. 936th Regt. | 2 Batts. 937th Regt. | 2 Batts. 938th Regt. | 2 Batts. 939th Regt. | 2 Batts. 940th Regt. | 2 Batts. 941st Regt. | 2 Batts. 942nd Regt. | 2 Batts. 943rd Regt. | 2 Batts. 944th Regt. | 2 Batts. 945th Regt. | 2 Batts. 946th Regt. | 2 Batts. 947th Regt. | 2 Batts. 948th Regt. | 2 Batts. 949th Regt. | 2 Batts. 950th Regt. | 2 Batts. 951st Regt. | 2 Batts. 952nd Regt. | 2 Batts. 953rd Regt. | 2 Batts. 954th Regt. | 2 Batts. 955th Regt. | 2 Batts. 956th Regt. | 2 Batts. 957th Regt. | 2 Batts. 958th Regt. | 2 Batts. 959th Regt. | 2 Batts. 960th Regt. | 2 Batts. 961st Regt. | 2 Batts. 962nd Regt. | 2 Batts. 963rd Regt. | 2 Batts. 964th Regt. | 2 Batts. 965th Regt. | 2 Batts. 966th Regt. | 2 Batts. 967th Regt. | 2 Batts. 968th Regt. | 2 Batts. 969th Regt. | 2 Batts. 970th Regt. | 2 Batts. 971st Regt. | 2 Batts. 972nd Regt. | 2 Batts. 973rd Regt. | 2 Batts. 974th Regt. | 2 Batts. 975th Regt. | 2 Batts. 976th Regt. | 2 Batts. 977th Regt. | 2 Batts. 978th Regt. | 2 Batts. 979th Regt. | 2 Batts. 980th Regt. | 2 Batts. 981st Regt. | 2 Batts. 982nd Regt. | 2 Batts. 983rd Regt. | 2 Batts. 984th Regt. | 2 Batts. 985th Regt. | 2 Batts. 986th Regt. | 2 Batts. 987th Regt. | 2 Batts. 988th Regt. | 2 Batts. 989th Regt. | 2 Batts. 990th Regt. | 2 Batts. 991st Regt. | 2 Batts. 992nd Regt. | 2 Batts. 993rd Regt. | 2 Batts. 994th Regt. | 2 Batts. 995th Regt. | 2 Batts. 996th Regt. | 2 Batts. 997th Regt. | 2 Batts. 998th Regt. | 2 Batts. 999th Regt. | 2 Batts. 1000th Regt. | 2 Batts. 1001st Regt. | 2 Batts. 1002nd Regt. | 2 Batts. 1003rd Regt. | 2 Batts. 1004th Regt. | 2 Batts. 1005th Regt. | 2 Batts. 1006th Regt. | 2 Batts. 1007th Regt. | 2 Batts. 1008th Regt. | 2 Batts. 1009th Regt. | 2 Batts. 1010th Regt. | 2 Batts. 1011th Regt. | 2 Batts. 1012th Regt. | 2 Batts. 1013th Regt. | 2 Batts. 1014th Regt. | 2 Batts. 1015th Regt. | 2 Batts. 1016th Regt. | 2 Batts. 1017th Regt. | 2 Batts. 1018th Regt. | 2 Batts. 1019th Regt. | 2 Batts. 1020th Regt. | 2 Batts. 1021st Regt. | 2 Batts. 1022nd Regt. | 2 Batts. 1023rd Regt. | 2 Batts. 1024th Regt. | 2 Batts. 1025th Regt. | 2 Batts. 1026th Regt. | 2 Batts. 1027th Regt. | 2 Batts. 1028th Regt. | 2 Batts. 1029th Regt. | 2 Batts. 1030th Regt. | 2 Batts. 1031st Regt. | 2 Batts. 1032nd Regt. | 2 Batts. 1033rd Regt. | 2 Batts. 1034th Regt. | 2 Batts. 1035th Regt. | 2 Batts. 1036th Regt. | 2 Batts. 1037th Regt. | 2 Batts. 1038th Regt. | 2 Batts. 1039th Regt. | 2 Batts. 1040th Regt. | 2 Batts. 1041st Regt. | 2 Batts. 1042nd Regt. | 2 Batts. 1043rd Regt. | 2 Batts. 1044th Regt. | 2 Batts. 1045th Regt. | 2 Batts. 1046th Regt. | 2 Batts. 1047th Regt. | 2 Batts. 1048th Regt. | 2 Batts. 1049th Regt. | 2 Batts. 1050th Regt. | 2 Batts. 1051st Regt. | 2

TABLE showing the quantities of certain MEDICINES used by the following Corps serving at Home during the Year 1868-9—*continued.*

Strength		1st Life Guards.	2nd Life Guards.	Royal Horse Guards.	6th Dragoons.	7th Dragoons.	9th Lancers.	10th Hussars.	11th Hussars.	17th Lancers.	3 Batts. Royal Artillery.	2 Batts. Grenadier Guards.	2 Batts. Coldstream Guards.	2 Batts. Scots Fusilier Guards.	1st Batt. 1st Regt.	1st Batt. 3rd Regt.	1st Batt. 60th Rifles.	1st Batt. 57th Regt.	1st Batt. 2nd Regt.	1st Batt. 23rd Regt.	42nd Regt.	68th Regt.	80th Regt.	94th Regt.	4th Batt. Brigade.	Cavalry Depôt.	1st Batt. 4th Regt.	1st Batt. 5th Regt.	1st Batt. 7th Fusiliers.	1st Batt. 9th Regt.	1st Batt. 24th Regt.	1st Batt. 69th Regt.	1st Batt. 99th Regt.	1st Batt. 100th Regt.	
		lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	
Spiritus Ætheris		1 8	2 8	..	1 0	0 12	0 6	2 0	2 8	0 2	2 4	1 0	..	..	..	..	0 8	..	0 12	0 15	0 7	..	0 4	1 10	0 4	2 12	2 8	0 10	1 2	0 2	1 14	0 11	..	Spiritus Ætheris
—— Ætheris Nitrosi		8 0	7 0	0	2 12	3 10	1 4	3 0	3 0	1 0	12	7	4	4	0	0	2 4	0	1 4	2 4	1 9	1 4	1 4	4 14	0	11 12	10 0	8 8	0 12	7	4	0	—— Ætheris Nitrosi
—— Chloroformi		4 0	4 0	2 0	0 7	1 4	1 0	2 4	0 8	0 10	1 8	11 0	2 10	0 13	1 6	0 4	0 11	0 3	1 14	0 8	2 13	0 13	2 0	1 0	7 0	7 0	4 12	4 5	1 6	4 0	2 13	0 2	—— Chloroformi
—— Ammonia Aromaticus		2 0	2 8	0 12	2 4	2 12	0 8	2 0	2 0	0 12	2 0	1 0	2 0	1 0	0 8	0 8	2 0	0 8	1 10	0 12	3 0	0 7	2 0	0 8	3 4	3 0	1 0	1 0	0 8	2 0	1 12	0 6	0 12	—— Ammonia Aromaticus
—— Ætheris	Phs.	2	2	..	2	2	1	2	2	..	2	1	..	..	..	..	1	..	1	2	1	..	..	2	2	4	5	0	1	2	1	..	..	—— Ætheris
[—— Ætheris	Methyl:]	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	[—— Ætheris Methyl:]
Sulphur		4 8	6 12	..	1 4	2 0	0 12	1 8	1 8	0 11	3	2 0	2 0	0 8	1 6	1 0	1 4	1 2	4	1 4	7	0	2	1 2	1 8	2	2 8	2 12	0 7	1 0	1 2	0 5	0 10	Sulphur
Syrupus Ferri Iodidi		4 0	0 1	1 4	0 4	0 2	0 2	2 8	1 6	0 2	1 6	1 0	1 0	0 8	1 6	1 0	2 0	0 6	1 4	2 0	0 6	1 8	2	2 8	2 12	0	2 0	0	0 10	1 4	1 5	0	0	Syrupus Ferri Iodidi
Tinctura Cinchonæ comp.		..	6 0	3 4	2 14	1 4	2 10	8	2 6	11 42	18 0	22 4	10 0	4 14	5 10	2 0	4 12	1 12	6 2	8 13 12		1 14	2 0	2 8	13 0	17 0	12 8	9 0	6 3	10 8	17 3	10 0	..	Tinctura Cinchonæ comp.
—— Cinchonæ Sulphatis		1 0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	—— Cinchonæ Sulphatis
—— Cardam : composita		1 0	4 0	..	0 11	0 10	1 4	1 8	..	1 12	2 0	4 8	1 8	2 0	2 0	1 0	2 0	0 6	1 4	0 7	2 2	0 11	2 0	1 8	6 8	5 0	1 10	1 8	3 0	2 4	2 15	0 10	..	—— Cardam : composita
—— Catechu		1 0	4 0	..	0 11	0 10	1 4	1 8	..	1 12	2 0	4 8	1 8	2 0	2 0	1 0	2 0	0 6	1 4	0 7	2 2	0 11	2 0	1 8	6 8	5 0	1 10	1 8	3 0	2 4	2 15	0 10	..	—— Catechu
—— Cinchonæ comp.		0 0	4 0	2 0	2 0	2 0	1 4	1 8	..	1 14	2 0	4 8	1 8	2 0	2 0	1 0	2 0	0 8	1 12	0 7	2 0	4 10	2 2	0 7	4 0	8 0	2 6	2 12	3 14	2 4	1 0	4 0	0 10	—— Cinchonæ comp.
—— Colchici Seminum		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	—— Colchici Seminum
—— Digitalis		..	..	..	0 11	..	0 12	1 0	..	0 12	1 0	2 0	1 0	..	1 0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	—— Digitalis
—— Ferri Perchloridi		6 0	2 8	1 0	2 0	1 8	1 8	3 4	4 0	2 8	4 10	17 14	7 12	1 10	6 0	2 0	2 0	0 8	1 12	2 2	0 11	2 4	3 2	0 6	6 4	10	7 8	2 14	1 13	2 0	2 2	..	..	—— Ferri Perchloridi
—— Sulphatis comp.		6 0	2 8	1 0	2 0	1 8	1 8	3 4	4 0	2 8	4 10	17 14	7 12	1 10	6 0	2 0	2 0	0 8	1 12	2 2	0 11	2 4	3 2	0 6	6 4	10	7 8	2 14	1 13	2 0	2 2	..	..	—— Sulphatis comp.
—— Hyoscyami		3 8	8 12	0 4	2 2	1 6	0 14	0 12	1 6	0 10	2 12	4 0	2 8	2 0	1 14	..	2 0	1 0	0 4	1 15	1 0	0 4	1 13	2 8	7 0	4 6	2 4	11 2	3 0	0 4	8	4 10	2 2	9	—— Hyoscyami
—— Iodi		0 12	..	..	0 2	0 2	0 2	0 4	0 4	0 2	0 4	0 8	0 4	0 2	0 4	0 2	0 4	0 2	0 2	0 2	0 2	0 2	0 2	0 4	0 4	0 4	0 4	0 4	0 4	0 2	0 2	0 2	0 2	—— Iodi
—— Lupuli : composita		4 0	2 0	..	0 2	0 5	1 2	2 8	..	1 1	1 3	1 0	0 4	0 15	1 12	1 8	1 10	1 0	0 6	1 8	0 10	0 12	1 4	1 4	0 8	..	..	..	0 8	0 15	0 9	..	..	—— Lupuli : composita
—— Scillæ		1 8	0 12	..	0 8	0 6	0 4	0 8	..	0 10	0 12	1 0	0 4	0 4	0 8	0 4	0 8	0 4	0 4	0 4	0 4	0 4	0 4	0 8	0 8	0 12	0 8	0 8	0 8	0 4	0 4	0 4	0 4	—— Scillæ Acetica
—— Opii		4 0	2 12	0 8	4 5	3 0	1 8	3 0	0 12	3 0	2 0	7 8	2 8	0 8	2 8	2 8	4 8	0 12	2 8	3 0	3 0	0 10	0 8	1 6	1 14	7 12	4 12	2 8	2 2	3 12	2 12	3 0	2 8	—— Opii
—— Rhei		4 0	2 0	0 8	2 0	1 8	1 8	3 4	4 0	2 8	4 10	17 14	7 12	1 10	6 0	2 0	2 0	0 8	1 12	2 2	0 11	2 4	3 2	0 6	6 4	10	7 8	2 14	1 13	2 0	2 2	..	..	—— Rhei
—— Scillæ		0 8	6 0	2 8	1 4	1 0	1 4	0 8	2 8	3	2 8	8	2 0	0 4	2 0	0 4	2 0	0 4	0 4	0 4	0 7	3 12	0 7	0 4	1 10	0 6	7 2	3 0	0 4	4 4	6 12	1 2	3 4	2 8	—— Scillæ
—— Senegæ		1 0	1 4	0 12	..	0 1	0 12	0 8	1 5	1 8	2 0	3 1	1 6	1 2	0 10	0 4	2 2	..	..	0 8	0 4	0 9	0 2	4 0	5 0	5 0	..	..	..	..	1 11	1 0	1 11	1 8	—— Senegæ
Vinum Antimoniale		2 0	3 8	1 12	0 14	1 0	..	1 12	0 6	3 0	1 0	1 4	0 4	0 15	1 0	1 6	0 12	..	..	2 8	0 1	0 7	0 5	2 8	0 12	2 0	8 0	0 15	2 5	0 12	1 1	..	..	Vinum Antimoniale
—— Colchici		..	..	0 12	0 4	0 2	0 2	0 4	0 4	0 2	0 4	0 8	0 4	0 2	0 4	0 2	0 4	0 4	0 2	0 2	0 2	0 2	0 2	0 4	0 4	0 4	0 4	0 4	0 4	0 2	0 2	0 2	0 2	—— Colchici
—— Ipecacuanhæ		6 0	1 8	1 12	1 7	1 14	1 12	2 8	3 4	5 12	13 0	6 0	6 8	1 10	2 12	2 12	4 12	2 0	2 0	2 0	2 0	0 11	4 0	2 8	12 8	4 6	3 10	6 6	0 8	2 12	2 14	..	..	—— Ipecacuanhæ
—— Opii		1 0	0 8	0 4	0 2	0 2	0 2	0 4	0 4	0 2	0 4	0 8	0 4	0 2	0 4	0 2	0 4	0 2	0 2	0 2	0 2	0 2	0 2	0 4	0 4	0 4	0 4	0 4	0 4	0 2	0 2	0 2	0 2	—— Opii
Ung : Cetacei		6 0	9 0	6 0	13 0	11 4	12 0	14 0	20 0	21 4	20 0	51 0	8 0	7 0	35 0	15 0	24 0	20 8	15 0	20 0	112 0	9 6	41 0	24 0	60 0	46 0	31 0	26 0	42 0	31 0	23 0	..	..	Ung : Cetacei
—— Resinæ		..	..	0 8	0 10	0 2	1 8	1 8	2 0	1 12	5 8	0 8	4 12	0 6	5 0	0 3	0 8	2 8	2 0	2 0	2 0	0 2	2 0	2 0	3 4	0 8	1 8	..	2 12	2 0	1 6	0 8	..	—— Resinæ
—— Hydrargyri		..	..	0 8	0 10	0 2	1 8	1 8	2 0	1 12	5 8	0 8	4 12	0 6	5 0	0 3	0 8	2 8	2 0	2 0	2 0	0 2	2 0	2 0	3 4	0 8	1 8	1 12	2 12	2 0	1 6	0 8	..	—— Hydrargyri
—— Nitratis		0 12	0 1	0 6	0 6	0 2	0 10	1 8	1 8	1 14	2 8	3 4	2 0	0 8	1 12	0 8	1 4	1 0	0 4	1 0	0 4	0 2	1 0	0 4	1 4	0 4	0 4	..	..	..	..	..	..	—— Nitratis
Zinci Sulphas		0 4	0 12	1 0	0 2	1 4	0 8	0 2	0 8	0 4	0 4	0 6	0 11	1 2	0 11	0 8	0 10	0 12	0 10	0 5	0 7	0 8	2 12	2 12	0 15	2 4	6 12	2 1	0 5	0 14	..	..	..	Zinci Sulphas
Zingiber		1 8	0 8	..	0 1	0 8	0 2	1 0	0 2	1 0	0 2	0 8	0 8	1 0	0 8	0 2	0 5	0 12	0 13	0 8	0 4	0 2	0 12	0 8	1 4	0 2	0 2	0 8	7	0 4	1 13	0 9	..	Zingiber
Linn. Flav.		12	4	1	7	8	14	13	15	12	40	72	26	4	28	10	13	7	71	29	33	31	11	20	9	17	131	23	8	16	14	11	..	Linn. Flav.
Rad.		23	18	14	3	6	12	11	17	40	103	24	24	31	32	11	13	7	29	31	31	25	11	45	37	20	8	8	8	16	14	11	..	Rad.
Surgeon's Tow		48	16	32	30	76	66	8	41	60	70	50	64	24	117	32	110	23	20	24	262	42	18	83	28	130	114	40	55	56	158	127	36	Surgeon's Tow
Skins of Leather		No. 1	1	..	0	0	0	1	1	..	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Skins of Leather
Adhesive Plaister, spread		3	12	6	37	8	10	10	21	27	110	37	34	14	37	26	17	29	14	29	57	7	67	24	72	36	42	25	26	44	19	37	..	Adhesive Plaister, spread
Soap Cerate Plaister, spread		2	3	1	8	..	..	1	3	5	20	6	6	2	6	..	..	..	..	..	1	4	..	14	2	18	18	7	..	7	11	8	..	Soap Cerate Plaister, spread
Isinglass Plaister		..	..	..	..	..	14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Isinglass Plaister
Surgeon's Sponge	No.	18	12	10	12	7	18	15	15	12	30	85	7	13	8	13	2	8	12	6	11	4	18	7	16	26	12	14	18	27	20	12	..	Surgeon's Sponge
Bandages, Calico		72	36	24	48	60	108	36	32	180	192	85	31	52	60	61	24	36	29	20	50	60	96	44	96	72	84	58	74	58	74	58	74	Bandages, Calico
—— Flannel		12	10	18	8	10	42	14	4	12	24	24	16	6	10	9	12	8	18	11	48	7	..	15	12	12	12	12	12	28	18	..	..	—— Flannel
—— Gauze		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	—— Gauze
Flannel for Fomentations		Yds. 8	8	6	84	4	6	12	8	27	80	7	3	2	9	21	4	10	11	8	21	8	6	17	10	18	5	9	9	28	8	2	..	Flannel for Fomentations
Surgeon's Bandages		12	12	12	13	12	12	12	12	20	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	Surgeon's Bandages
Oiled Silk		Yds. 1	2	2	1	1	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Oiled Silk
V. I. R. Cloth		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	V. I. R. Cloth
Gutta Percha Tissue		4	2	2	24	2	8	4	4	8	24	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	Gutta Percha Tissue
Carded Cotton		lb. 2	2	2	2	2	2	2	2	5	12	..	..	..	..	..	..	..	..	..	2	..	..	2	2	2	2	2	2	2	2	2	2	Carded Cotton

from one of the attacks, he died suddenly from exhaustion. On *post-mortem* examination, the sternum was found to be eroded on its inner surface, near the right sterno-clavicular articulation. The right lung was healthy; the left was adherent to the walls of the chest, from recent pleurisy. The heart was only slightly enlarged, and was otherwise normal; the usual white spot existed on the anterior surface. The aneurism involved the roots of all the vessels springing from the arch of the aorta; it was about the size of a goose's egg, and contained a clot of decolorised fibrine. In addition to the large aneurism, there was another about the size of a walnut, a little lower down the aorta; it had well-defined walls, and opened into the aorta by a passage about the size of a man's finger. The trachea was congested, and studded with ulcers; the œsophagus was also in close connection with the tumour, but did not show any signs of injury from pressure; the abdominal viscera were congested, but otherwise they were healthy; the internal coat of the aorta appeared thickened and puckered up.

The supposed duration of this case indicates a very rapid formation of the tumour, viz., from the 14th of April, death occurring on June 14th. At times, a bruit was heard in the course of the aorta, but it was not constant. There was no difference in power detected between the radial pulses.

A paper by Surgeon Lamprey, 67th Regiment, was read before the Society, showing the valuable results derived from the injection of a solution of carbolic acid into the cavities resulting from suppurating bubo. The solution was of the strength of one part of the acid to ten parts of water. The bubo, when soft and fluctuating, was first opened by a small incision, vertical to Poupart's ligament. Any secondary abscesses were opened by passing a director from the first opening into them, and then cutting down upon its point; no difficulty was found in making this communication. After the discharge of the pus, the solution was injected with a common glass syringe, and repeated every two days until a cure was effected, which generally required a period of about ten days from the first injection. By this method, the large and painful incisions necessitated by the old method of cure were done away with. The small incision, from being vertical to Poupart's ligament, was not continually disturbed by every movement of the thigh. The discharge, after the first injection, lost its purulent character, and became clear and watery. In the five cases brought before the Society there had been no relapse.

5th August, 1868.—A paper by Assistant-Surgeon Bredin, 97th Regiment, stationed at Aldershot, on the "Nervous Diseases of Soldiers," was read by Staff Assistant-Surgeon Adcock. The author entered very fully into the subject, and stated the latest opinions and mode of treatment of these diseases.

Assistant-Surgeon Ball, 33rd Regiment, then read a most interesting paper on the medical transactions of the 33rd Regiment during the Abyssinian Campaign. It detailed the nature of the medical arrangements made at Bombay, but which, as is usual, could not be carried out when actual service began; the nature of the country through which the Force advanced from Zula to Magdala; and gave many interesting particulars in regard to the various races of people met with. But what was of the greatest consequence, in a professional point of view, were the details which Dr. Ball gave in regard to the orders issued in Abyssinia itself, and other means to protect the health of the soldiers, and to provide for the requirements of such as fell sick or were wounded.

2nd Sept., 1868.—Surgeon Poulton, 35th Regiment, read a paper on a case of "Sporadic Cholera" that lately occurred in a soldier in Portsmouth Garrison. The subject of the attack, who was 37 years of age, and had served in the Army 21 years, was, on the 7th of last August, brought to hospital in a state of collapse, with livid face and hands, sunken eyes, cold breath, hollow voice, and all the ordinary symptoms of that disease in an aggravated form. In the early part of the preceding night he had become affected with diarrhœa, the matters voided being described as greenish and watery. On questioning him, however, the fact was elicited that a degree of laxity in the state of his bowels had been observed on the morning of the day before his admission, although not until shortly before he was brought under treatment did *cramps* occur in his lower limbs and weakness becoming alarming. The treatment employed consisted of stimulants internally and rubefacients externally, a few

grains of calomel with opium, which were given on his admission, having been instantly rejected. Ice, in small quantities, was placed in his mouth as often as he expressed a wish for it. His condition remained critical until the morning of the third day after admission, when a distinct improvement was observable. Urine was then for the first time voided, the evacuations became fæcal, and recovery from that period progressed favourably.

Dr. Jesset, of Cosham, read a paper on "The Use of Carbolic Acid in the Treatment of Wounds, &c." He considered that it would be well if Surgeons had to refer to their notes of former years, and compare their cases of gunshot wounds, compound fractures, and ordinary wounds treated in the old way, with those that have, during the past 12 or 18 months, been treated with carbolic acid. It appeared to him that, as applied, the remedy, in many instances, had no other effect than that of assisting nature, and as excluding the air from the wound or sore to which it is applied. He then alluded to some of the cases lately published, in which peculiar virtues were attributed to carbolic acid; and expressed a belief that recovery would in all of them have been equally effected by ordinary means. He believed that when suppuration had already taken place, the acid acted as an antiseptic or disinfectant, and quoted some cases in support of his views.

Dr. Lamprey, Surgeon, 67th Regiment, brought forward "A Case of Indurated Chancre treated by Excision." He stated, "On August 11th I removed "the ulcer—a sore about half an inch long, on the prepuce, narrow and oval "in shape—by one clean cut with the scissors, applied strong undiluted car- "bolic acid to the fresh cut surface, which caused little pain; it was described "as a burning feel at first, but very transitory; the bleeding ceased on the "application of the carbolic acid. I then brought the edges of the wound "together by four fine needles, and allowed them to remain in position till the "following morning, when they were removed. It was expected that the "wound would have united by the first intention, and this was thought to be "the case till the gaping of the wound some days afterwards dissipated the "idea. Subsequently the margin of the wound became thick and indurated; "the surface unhealthy, ashy yellow in colour, and in short it presented all the "characters of the original sore, thus bearing out the general experience of "treatment in such cases. Observing this to be the case, I ordered the iod. "potass. he was taking to be increased to 1½ grains three times a-day, and pil. "hydrarg., 5 grains to be taken every third night. It was observed that the "effect of this treatment gradually produced healthy action in the blood; and "though only four pills have been taken between the 22nd July and the "2nd September, the whole character of the sore is altered. A margin of new "skin is now forming around it, vascular granulations are taking the place of "the yellow surface, and the hardening and prominence of the edges are sub- "siding. The local application consists of acid carbolic much diluted."

Dr. Bruen, 67th Regiment, exhibited a specimen of aneurism of the aorta, and offered some remarks on that disease, which he considered to be more common in the Army than in civil life, but much more so in the latter than was generally believed, in consequence of the difficulty experienced in performing *post-mortem* examinations, except in the public services.

Some remarks by Dr. Bredin, 97th Regiment, on delirium tremens, were read, after which the Chairman (Dr. Gordon) read some extracts from a report just received from Staff-Surgeon Roch, in which that Medical Officer gave an account of the voyage of the ship "Golden Fleece" from Annesley Bay to Portsmouth, *viâ* the Cape, with invalids from Abyssinia. On the 5th June, 119 sick soldiers and 15 sick officers embarked on board that vessel: of the former, 8 died on the voyage, and on arrival of the ship at this port, 111 were sent to Netley. Of the 15 officers embarked, 14 were under medical treatment during the voyage; one disembarked at Aden, and 13 at Portsmouth for Netley. Among the troops, the prevailing diseases, at the time of embarkation, were dysentery, diarrhœa, and hepatitis. There were also two men who had suffered from insolatio, two from fractures, and five from gunshot wounds. The officers were, like the soldiers, chiefly affected with hepatic diseases: two laboured under the effects of insolatio, three from diarrhœa, and two from rheumatism.

"The heat on the Red Sea was intense and oppressive, and two soldiers died

of heat apoplexy before the ship reached Aden, at which place it arrived on the 7th of the month. Three other deaths—namely, one by continued fever, one by hepatitis, and one by chronic dysentery—occurred between that date and the 14th July, on which day the "Golden Fleece" made Simon's Bay.

On the following day, a soldier died from cancer in the stomach; on the 16th, one from relapse of dysentery; and on the 19th, one from diarrhœa and general debility, after which no deaths occurred during the passage.

After leaving the Cape, the more severely ill among the men were separated from the less severely affected, the latter being all accommodated on the lower deck. Parades took place three times a-week, for the examination, by the Medical Officer, of the men not actually confined to bed; and on the 16th of August, at one of the parades so held, a soldier was found affected with scurvy in a slight degree. A minute inspection of the invalids was held the following day, and a general tendency to the disease detected, although only apparent in the state of the gums, and most distinctly so amongst the convalescents on the lower deck. The numbers who had, in the first instance, been allotted to that part of the vessel were now diminished; pickles, lime-juice, and fresh meat were liberally given from the time that the scorbutic tendency was observed. On the 23rd of August the ship touched at St. Mary's, one of the Western Islands, at which place a supply of fresh fruit was obtained. The scorbutic tendency had, however, begun to give way, as the Medical Officer thinks, chiefly in consequence of additional space having been granted to the men on the lower deck.

He notices the fact that the scale of rations had been good and sufficiently varied throughout the passage, and that therefore the cachectic condition alluded to could not be attributed to any defect connected with food.

Oct. 7th, 1868.—Dr. Lamprey, 67th Regiment, read a paper on "Aneurism of the Thoracic and Abdominal Aorta," with reports of cases furnished by Surgeon Porter, 97th Regiment, at Aldershot, and by Surgeon-Major Sinclair, 33rd Regiment, at Portsmouth, illustrated by drawings and a recent preparation. Dr. Gordon, C.B. (President) then read a contribution from Dr. Lawson, Inspector-General, on "Yellow Fever," in support of the view of its being non-contagious, and of the liability to repeated attacks. Dr. Lawson admits that the miasma on which yellow fever depends can be carried in a ship from one place to another, and can produce the disease among those submitted to its influence, and is of opinion that local, as distinguished from personal causes, are the most important features in the etiology of the disease.

Sir David Deas, K.C.B., who was present, and who, from actual personal experience of a remarkable epidemic on the coast of Brazil in 1848, was able to speak on the several points of Dr. Lawson's paper, held similar views; but enunciated his belief that the disease was at times contagious, that the same liability to a second attack existed as in small-pox; that during its prevalence all other zymotic diseases subsided; that he had never known a case in which complete suppression of the urine existed, recover; that he was also of opinion that the influence on which the disease depended may become dormant for a time, again to spring into activity, and that he had observed the prevalence of epizootic diseases amongst the lower animals, smut and mildew upon trees, immediately before an outbreak of yellow fever amongst the population.

The Honorary Secretary then read a few notes of a case of suicidal gunshot wound of the skull, sent by Assistant-Surgeon McFall, 34th Regiment, stationed at Aldershot. The subject was a private in the above regiment, who committed suicide on the night of the 12th September, 1868, in camp, at Cove Common, Aldershot. The bullet entered just above the thyroid cartilage, passed upwards through the mouth and base of the skull, a large portion of of which it carried with it, and smashed into atoms; these were found mixed up with the brain; it then struck against the superior angle of the occipital bone, and broke into five pieces, which, when removed, weighed, together with the wooden plug, 471 grains, the weight of a Snider bullet being 520 grains.

The peculiarity of this case was, that the bullet did not pass through the shako, but broke into the number of pieces above mentioned.

Nov. 4th, 1868.—Surgeon Perry, R.A., brought before the Society the details of two cases of "Pleuro-Pneumonia, followed by Hydrothorax and Empy-

ema," which occurred in his practice, with the means of showing the importance of resorting to surgical measures in such cases as a means of prolonging life. The first case was that of a soldier who was attacked with pleuro-pneumonia, followed by great effusion, not yielding to ordinary treatment. His symptoms became so urgent that there was no hope of doing him good except by puncturing his chest. This was accordingly done, and 44 ozs. of pale green-coloured pus evacuated with the greatest relief. In a week from the date of the paracentesis being performed, the partially cicatrized wound opened during a fit of coughing, and 73 ozs. of similar fluid flowed out. The wound was closed, but in another month the operation had to be performed, when 50 ozs. were withdrawn. The cicatrix subsequently broke up again, giving exit to from 8 ozs. to 10 ozs. a-day. The man's life was prolonged at least three months by the operation, and during that time more than 300 ozs. of pus were evacuated.

The second case was that also of an Artilleryman who suffered from the same disease, and whose chest was punctured six times in as many months, the quantity evacuated at each operation varying from 48 ozs. to 84 ozs., but at one time amounting to as much as 210 ozs.! Upon the last operation being performed, a paroxysm of very severe coughing took place, and, in spite of all endeavours to prevent it, a quantity of air was sucked into the plural cavity. Spontaneous breaking up of the freshly formed cicatrix soon followed, but by careful nursing he was kept alive for three months longer. During this time, from 10 ozs. to 11 ozs. of pus were secreted daily, and a period of very nearly nine months elapsed between the first evacuation of the fluid to the fatal termination of the case; in that long period more than 1,500 ozs. of sero-purulent fluid were secreted and evacuated.

The autopsy of the first case elicited no particular point of pathological interest except as regarded the pyogenic pleural membrane and the collapsed and carnified condition of the lung; but in the last, with these same conditions, there were discovered miliary abscesses in the kidneys, spleen, and remaining lung, whilst the interior of the mesenteric glands was also full of purulent matter. These abscesses bore the greatest resemblance to those of tubercle, but were evidently due to pyæmic poisoning from the affected pleura.

Assistant-Surgeon S. Maunsell, R.A., then read a paper on "Mortality in India according to Temperament." In his experience, the sanguine and bilious were the two temperaments which came most prominently before the Medical Officer in India. Fever—intermittent and remittent—dysentery, and hepatitis were severe among men of dark complexion, sallow face, or of bilious temperament; but men of sanguine temperament, fresh complexion, light hair, and blue eyes, though very liable to be attacked by the diseases of the country, the affections were in them less severe, and their effects more transient. Europeans landing in India fresh from England, bring with them a stock of nervous force and vital energy which act as protecting powers. The longer they remain in the country the more their innate powers of resistance gave away, ; the balance turned, the diseases by which they are affected takes on an æsthenic character. He produced a list given him by Dr. Gordon of 62 cases of hepatitis terminating fatally. The patients had been admitted to the hospital of the 10th Regiment during 14 years; 21 of these cases were of the bilious, and 41 of the sanguineous temperament.

Assistant-Surgeon O'Leary (Honorary Secretary) then read a paper by Assistant-Surgeon Clarke, R.A., on a case of "Malingering," the subject of which (a soldier in the battery under his medical charge)-persistently continued in his endeavours to feign disease, but was eventually not only detected, but tried, convicted, and punished for the offence, and was, at the date of the report, in the performance of his duty.

Dec. 3rd, 1869.—Surgeon Franklyn, R.A., exhibited under the microscope a Guinea-worm extracted from the ankle of a soldier recently returned from Abyssinia, where he had probably become affected by the parasite.

Staff-Surgeon Roch then read a paper on "Heat Apoplexy." He expressed the opinion that insolation, or sunstroke, and heat apoplexy are different diseases; that not only were the symptoms dissimilar, but so also were the *post-mortem* appearances in fatal cases, and the treatment applicable during life. Of

seven cases of these affections treated by him on board the "Golden Fleece," in Annesley Bay, in May 1868, six occurred as secondary diseases in persons debilitated by various causes, amongst which were dysentery, diarrhœa, fever, and delirium tremens. He believed that the disease depended more upon a stagnant state of the atmosphere than on actual increased temperature. In one case, the rise of the temperature in the axillæ reached 113° Fahr.; in five cases the treatment consisted of the cold douche, the application of ice to the head and spine, mustard to the lower extremities, stimulating enemata, &c. All the men so treated died. In the sixth case, the patient was bled from the temporal artery; he recovered consciousness, but was unable to articulate; he had a relapse six days afterwards, and died in six hours. The seventh patient was also bled from the temporal arteries, and, for a time, was restored to consciousness; he, however, relapsed the following day, and died.

Dr. Elliot, late Royal Navy, then read a paper on "The Communicability of Phthisis." He alluded to the fact that, about 18 months ago, Dr. Budd, of Bristol, called attention to the idiosyncrasy of phthisis and zymotic diseases and to its capability of being transmitted from one person to another. He noticed some of the experiments that have been introduced in this country and on the Continent in regard to the subject, mentioning in particular those of Cheauveau, and expressed an opinion that up to the present time the weight of evidence was in favour of the disease being communicable. The great questions for consideration, he believed, were whether it is not unjustifiable to allow healthy persons to be in such frequent contact with the diseased as to run the risk of becoming themselves affected? under what circumstances may such communication with the affected take place without risk? and what are the means of prevention? His own attention was drawn to the subject in 1854, when a very strong, healthy young man, without hereditary taint of scrofula or tubercle, married a woman in an advanced stage of phthisis; the wife died, and three months afterwards the husband was found to be labouring under the disease that had proved fatal to her. From that time his attention had been directed to the possibility of the disease being thus communicated, and he had met with so many confirmatory instances as now to have no doubt on the subject. He did not believe that phthisis ever is cured; it may be for a time arrested, but never cured, and he questions if in any case of reported cure tubercular deposit had really existed; finally, he alluded to the observations lately put forward by the Registrar-General of the decrease of the cases of phthisis in districts that have been recently drained, a circumstance which he believes affords some hope that, by this means, much may yet be done to mitigate the prevalence of the scourge in question.

Surgeon Lamprey, 67th Regiment, then described a method of making interrupted sutures by means of fine cambric needles, a detailed account of which afterwards appeared in the medical journals.

Jan. 6th, 1869.—Staff-Surgeon Roch read a paper on "The Natural History of Abyssinia," illustrative specimens of which he exhibited. Of the mammalia, he had on the table the skull of the wart hog (*Phascocœres*); several skins of Salt's anetlope (*Neotragus*), called also Beni Israel deer; of owls, the white backed crow (*Corvus Leuconotis*), the Arabian bustard (*Otis Arabis*), the francoline (*Francolinus*), the guinea fowl (*Numida*), the black-tinted gannet (*Sula Melanen*), the rosy tropic bird (*Phæton Phœnicurus*); of *Pisces*, the eagle ray (*Myliobatis aquila*), the saw fish (*Pristis*), and a large goboid fish, the name of which is as yet undetermined.

Assistant-Surgeon S. Maunsell, R.A., in exhibiting a series of geological specimens, briefly sketched the history of the science. He indicated the order in which organic life appears in fossiliferous strata, tracing them upwards from the *trilobite*, then reptiles, fishes, and crustaceæ, marsupials, and culminating in *man*.

Dr. Gordon read a paper on the "Study of Conchology," and proceeded to exhibit a series of land and fresh-water shells of England, presented to the Society by Assistant-Surgeon Tate, of the Royal Artillery. They included various species of the following genera, namely:—1, Cyclostoma; 2, Bithynia; 3, Valvata; 4, Zonites, 5; Helix; 6, Succinea; 7, Bulimus; 8, Zua; 9, Azeca; 10, Pupa; 11, Clausilia; 12, Carychium; 13, Lymneus; 14, Cyclas; and 15, Pisidium.

Feb. 3rd, 1869.—Assistant-Surgeon Power, 2nd Battalion 13th Regiment Light Infantry, read a paper on "The Topography of the Mauritius in relation to the Epidemic of Malarial Fever in 1867." He observed that the island presented a central elevated plateau irregularly surrounded by detached hills, the remains of an old crater wall; that its northern part was irregular, broken into a series of small ridges and valleys; its soil thin, and its surface much covered with basaltic rocks. Towards the south the island presented a succession of mountains and spurs of hills, and everywhere the land sloped, more or less irregularly, towards the sea, a belt of coral, thickest towards the southern end, almost entirely surrounding it. Forests now only exist in a few of the upper districts, having, within recent times, been in part destroyed. Rivers run chiefly on the windward side, and the prevailing rock of the island is columnar basalt, the whole apparently still undergoing a gradual process of upheaval. The soils are of stiff ferruginous clay, especially in the middle of the island and near the hills; in other places, it is of a dark slate colour. To the seaward there is much flat marshy ground charged with organic matter. He entered into particulars regarding the meteorology of the island, and observed that the districts where fever most prevailed were on the leeward side of the island, where, under ordinary circumstances, the greatest rainfall took place. He observed that, until within the last few years, no marked malarial fever was known in Mauritius; indeed, less than occurred in the fenny districts of England. The chief characteristics of the hot season of 1866–7, he observed were—1st, an absence of rain in the proper rainy season; 2nd, greater and more continued heat than usual; 3rd, the absence of the usual electrical phenomena, as thunder and lightning; and, 4th, the absence of cyclones. There was thus a comparative stagnation of the atmosphere, the breezes that did prevail being only local in their nature. He observed that high temperature and an absence of rain, acting upon soil saturated with organic matter, were the exciting causes of the fever, many of the parts left dry having heretofore been always covered with water, and the temperature being further raised by the circumstance of the sun's rays being absorbed and retained by the thinly covered basaltic rock. He believed that this view was confirmed by the fact that those parts where the greatest rainfall occurred, and where the soil was moist, were free from the fever which elsewhere prevailed.

Enteric fever is not, as a rule, he thinks, recognized in the Mauritius, and that when, in 1867, it did occur, it was due to typhoid poison, and not to malaria.

A case of calculus in the bladder, reported by Surgeon Porter, 97th Regiment, was then read. A native of India, aged 22, applied to Dr. Porter for relief from a large vesical calculus, whose presence was readily detected. In addition to the ordinary symptoms of stone, there existed a fistulous opening in the right lumbar region, evidently connected with the kidney, through which passed urine, pus, and gravel. The lateral operation was performed, and, after considerable difficulty, the calculus extracted. It was found to consist of the triple phosphates, and weighed 3 ozs. 4 drms. The health of the patient rapidly improved, the fistula in the lumbar region closed, and in six weeks after the operation the man returned to his home.

Assistant-Surgeon Alcock, 35th Regiment, then read a paper on "The Influence of Nervous Power in controlling the Temperature of the Body," which was afterwards published *in extenso* in the medical journals.

March 3rd, 1869.—Assistant-Surgeon J. Ross Murray, R.A., read a few notes of the case of a soldier who lately died of cancer of the stomach; after which, this meeting being the anniversary of the establishment of the Society, the Chairman (Dr. Poulton) read a *résumé* of its proceedings for the past year (prepared by Dr. Gordon, C.B., who was unavoidably prevented from being present), which set forth the objects of the Society, and the advantages accruing to its members, not only from the interchange of professional opinions and experience, but also from thus being brought into more personal communication with their brethren in the sister Service and in Civil practice. He also referred to the fact of its being the means of affording access to periodicals and the current medical literature of the day far exceeding that possessed by any garrison of equal size in the kingdom. In conclusion, he enumerated the various papers on medical and scientific subjects which had been contributed to, and read before the Society throughout the year.

Assistant-Surgeon Power, 2nd Battalion 13th Regiment, then resumed his account of the Malarial Fever of the Mauritius, and proceeded to give his views and opinions in reply to certain questions which had been addressed to him on this subject at the last meeting. His conclusions were as follows:—

1st. That the exciting causes of the fever were the exceptional want of rain in an island whose climate is naturally humid and the rainfall great, and the unusually high temperature existing at the time.

2nd. That, notwithstanding the existence of the powerful malarious poison, there was no such hybrid disease as malarious dysentery.

3rd. That the fact of the fever proving so fatal to the Civil population was due to the want of quinine, proper nourishment, and nursing, and not to its incurable nature.

4th. That the cause of relapses is lowering of temperature, particularly if sudden.

April 7th, 1869.—Dr. Stone, R.N., read a paper on "Medicine and Surgery in Japan," in the course of which the principal diseases of that country were discussed. Small-pox, which is very prevalent there, has decreased considerably in several districts since vaccination came to be practised, the general mortality having sensibly diminished since its introduction. Syphilis, which is very rife, has been inherent to the country several centuries. Of late a system of periodical medical examination of prostitutes has been instituted at the chief open ports by the native Government; keepers of houses of resort are licensed and taxed. The girls are usually sold by needy parents for definite periods to the proprietors of those places, and on the completion of their period of service return to their home, no social slur attaching to them on account of their previous life. Within the last 18 months, the services of an English Naval surgeon have been secured at Yokohama in connection with a system of Lock hospitals.

Rheumatism, scabies, elephantiasis, pulmonary diseases, and an intractable native affection, called the "stomach pain," probably a species of ulceration, were also enumerated.

The evidently European origin of their present ideas of medical practice, and the Dutch instrumentality by which this was brought about, were commented upon. Mention was also made of the medical school at Nagasaki, under the superintendence of Dr. Baudwin, a Dutch military surgeon. One unfortunate circumstance which acts as a bar to the acquirement of sound knowledge amongst the Japanese students is the prohibition of dissections. Dr. Baudwin, however, endeavours to make up for this by the use of elaborate plates. The universal use in Japan of our chief medicines, as iodide of potassium, sulphate of quinine, mercury, &c., is an interesting fact.

Assistant-Surgeon O'Leary (Honorary Secretary) then read a paper giving the details of three cases of aneurism which came under the observation of Staff Assistant-Surgeon Lamb while on service in New Zealand and Tasmania, all of which proved fatal. The first case was that of a man of the Army Hospital Corps, who was admitted to hospital at Auckland, with a large swelling (about the size of an orange), which proved to be an aneurism just under Poupart's ligament (right side), and constricted by it. Pressure was applied to the distal side of the tumour, and he was put on low diet, the result of which was that the pulsation diminished in force, and the tumour became solid, but increased in size, and continued to do so till it affected the respiration by its pressure on the diaphragm. He gradually became worse, and eventually died. The *post-mortem* disclosed an enormous aneurism, extending from about six inches below Poupart's ligament up to the diaphragm, occupying the entire right side of the abdomen, pushing the liver and kidney in front of it and to the other side. The original opening in the artery was just under Poupart's ligament, and was directed backwards against the brim of the pelvis, which was partly absorbed by the pressure; it had then forced its way under the peritoneum upwards on the psoas and iliacus muscles; across the anterior surface of the tumour, passed the external iliac artery. All the muscles between the tuberosity of the ischium and the lesser trochanter were disintegrated, and there was a cavity containing about a quart of semi-fluid blood. The second case was that of a robust, healthy-looking, temperate gentleman in New Zealand, who suddenly slipped off his chair and died. The *post-mortem* disclosed the pericardium full of blood, which had escaped from the rupture of a

very small aneurism, about half an inch above the right coronary artery. The sac was just large enough to admit the top of the little finger. The third case was that of a soldier in the 2nd Battalion 14th Regiment, who complained of intense pain down the left thigh, and particularly referred to one spot just above the patella. The most careful examination failed to detect any tumour or bruit. He died rather suddenly. The *post-mortem* disclosed a large pyriform aneurism of the abdominal aorta opposite the first and second lumbar vertebræ, the bodies of which were almost entirely absorbed, the intervening cartilage being unaffected. Across the anterior surface of the aneurism passed the anterior crural nerve, shortened and flattened out, and its fibres separated. The kidney on that side had almost disappeared.

The point of interest in this case was the existence of so large an aneurism, receiving its current of blood from the aorta, and issuing at a right angle to the course of that vessel, without any bruit being audible, or any other visible sign to establish the true nature of the disease.

A paper by Surgeon Porter, 97th Regiment, followed, on "A Case of Popliteal Aneurism cured by Compression." This paper has been published, *in extenso*, in the Departmental Blue Book for 1867.

5th May, 1869.—Two cases of "Cerebro-Spinal Fever," which had lately occurred among the troops in garrison, were brought before the Society. The first, described by Assistant-Surgeon J. Ross Murray, R.A., was that of a driver, æt. 18 years, with 5 months' service, of temperate habits and well conducted. He was admitted to hospital on the 15th April, 1869, complaining of lassitude, anxiety at præcordia, and slight febrile symptoms. An eruption of a petechial character having appeared on the legs an hour or two after admission to his battery hospital, as a precaution he was removed, the same afternoon, to the infection ward at Portsmouth. He stated that on the day previous he had been drinking with a comrade (since dead from the same disease) in a public house in a low and dirty part of Portsmouth.

On the morning of the 16th, when seen for the first time by Dr. Murray, to whose care he was transferred, he had passed a restless night from severe and continued vomiting of dark-green bilious matter and frequent purging. He was slightly feverish. A diaphoretic mixture was now prescribed. On the 17th, symptoms had developed which left no doubt of the nature of the case; delirium had set in, with intervals, during which he was very apathetic, but answered questions rationally. There was now well-marked retraction of the head (opisthotonos); great pain in the muscles of the back, extending down the lumber region; and muscular debility of the lower extremities, almost amounting to paralysis. Pulse, 84; temperature in axillæ, 100°; skin moderately cool and moist. Quinine, grs. iv., calomel, grs. ij., opium, gr. ¼, were now ordered every second hour; ice to be applied to the head, a blister to the nape of the neck, and dry cupping along the spine. At evening visit, the delirium was found to have increased, the retraction of the head was more marked, and the pulse had risen to 120; there was conjunctivitis of the right eye; temperature in the axillæ, 101°; respirations, 23. On the 18th he was semi-comatose; the right cornea had become quite opaque, the eruption had commenced to fade, but the retraction of the head was still well marked. Some urine obtained for examination showed a sp. gr. 1,006, was slightly deficient in chlorides, but gave no trace of albumen. He got gradually worse towards evening, and was evidently sinking. Pulse, 92; respirations, 25; temperature, 108°.

On the morning of the 19th complete coma had set in; the pulse was very rapid (152), small, and thready; temperature, 105°; respirations, 41; tongue dry, brown, and glazed. In addition to the petechiæ on the legs, a bruised appearance of the skin of the lower extremities showed itself. He died at 3·40 P.M. on the 19th, the fifth day.

On *post-mortem* examination, 24 hours after death, the spinal sub-arachnoid space was found filled with a layer of greenish yellow lymph, which closed the spinal cord from the medulla downwards; the substance of the cord itself appeared normal to the naked eye. On reflecting the dura mater cerebri, an extensive deposit of greenish yellow colour, closely resembling pus, was seen through the arachnoid, but proving, when cut into, to be firm lymph, following closely the vessels of the pia mater, which were themselves much congested

with fluid blood. The lateral ventricles were distended with serum, and the crura pons varolii and optic commissure were covered anteriorly by a thick, greenish, glutinous-looking lymph, which extended along the right optic nerve for about a third of an inch. A layer of lymph coated the anterior surface of the iris of the right eye. A water-colour drawing by Dr. Lamprey, 67th Regiment, was exhibited, showing very exactly the appearance of the cerebral lobes when the dura mater was reflected.

The second case, read to the Society by Dr. Park, R.A., was that of a driver of the 11th Brigade, a comrade of the former man, æt. 29, service 9 years, whose habits were temperate and conduct good. He had been absent in Portsmouth for three days, the greater part of which was spent in his company at the same public house. He returned to Hilsea on the 16th April, and was punished for absence by seven days' confinement to barracks. He reported sick early on the morning of the 20th April, as he was unable to attend stables at half-past five in the morning, and complained of general feeling of "malaise," with pains in the lower extremities, slight sore throat, pain at præcordia, and extreme restlessness. His symptoms resembled those of the cold stage of ague, with marked "cutis anserina," eyes suffused, quickened pulse, and the tongue coated with a whitish fur. A cathartic dose of infusion of senna and sulphate of magnesia was given, and the throat was swabbed with a solution of nitrate of silver. Two hours afterwards, at 9 A.M., there was very great exhaustion; pulse 130, small and wiry; he complained of coldness of the lower extremities, and great frontal headache; there was no eruption. At 3 P.M. he was still more prostrated, and was now covered with large black patches of ecchymosis, the general hue of the skin being a dusky yellow. He was perfectly conscious and rational till about twenty minutes before his death, which took place at 5·20 P.M., rather suddenly. Just before death, he ejected some bloody mucous from the mouth and nose. At 9 A.M., 5 grains of calomel were prescribed, and ordered to be followed by 5 grains of quinine every two hours. Beef-tea and brandy were given.

Post-mortem examination, 42 hours after death, showed the membrane of the brain and spinal cord intensely congested, and the sinuses monstrously distended with dark fluid blood. There was considerable effusion into the subarachnoid space, and the cerebral ventricles contained an ounce of pinkish serum. The brain and upper part of the spinal cord showed numerous red points or sections; the lungs were gorged with blood; the right side of the heart contained fluid blood, while the left was empty. The blood was everywhere fluid, of a dark colour, and apparently disorganized; it continued to ooze out for some hours after the *post-mortem* examination was completed.

Assistant-Surgeon O'Leary, Honorary Secretary, read a paper by Assistant-Surgeon Wales, R.H.A., "On a Peculiar Form of Arthritis," and another on a form of cholera, both believed to have been occasioned by foul emanations.

2nd June, 1869.—Dr. Gordon, C.B., in submitting to the Society a communication he had received from the President of the Metropolitan Association of Medical Officers of Health, on the subject of "Contamination of Potable Water by Sewage," briefly pointed out the present position of the question, which resolves itself into two divisions: namely, whether rivers fouled by sewage and manufacturing refuse have or have not a self-purifying power; and whether the nitrogeneous compounds of river and well water must necessarily have a previous sewage or manure origin.

Dr. Gordon entered very fully into the subject, stating his views and opinions, and laid the matter before the members of the Society with a view to elicit from those who had given the matter their attention some information on the subject. A discussion ensued, in the course of which Dr. Robertson, R.M.A., and others, expressed their opinions, and made observations bearing upon the matter.

In connection with the above, Assistant-Surgeon O'Leary, Honorary Secretary, read a paper by Surgeon Lamprey, 67th Regiment, "On the Sources of the Contamination of Waters in China," and more especially at Shanghai, where those of the Soochow Creek are rendered constantly foul by the decomposition of the remains of human bodies that are "buried" at intervals, and in all directions, around the city, as well as by the constant flow of sewage matters from the city.

Assistant-Surgeon Robertson, R.M.A., then read a paper "On Diseases of the Heart in the Royal Navy," which has been published *in extenso* in the medical journals.

7th July, 1869.—Dr. J. Ward Cousins, of Portsea, read notes of a case of "Hæmorrhagic Diathesis" treated by him, in which a young man who from early youth manifested a remarkable liability to bleeding on the receipt of trivial injuries, having sustained a slight fall through accident in the street, was speedily seized with symptoms indicating the occurrence of effusion of blood in the substance of the brain. He had advanced considerably towards recovery, when, six months after the accident, he met with a second of the same nature, causing a recurrence of the effusion, and rapidly ending in death. The *post-mortem* appearances and remarks by Dr. Cousins have been published at length in the medical journals.

Dr. Gordon, C.B., then read a paper by Assistant-Surgeon Tate, R.A., "On the Medicinal Plants of Great Britain," specimens of which were at the same time exhibited. Dr. Tate noticed the circumstance that such plants are divisible into the following classes, namely:—1st. Narcotic, such as aconite, henbane, &c.; 2nd. Expectorant, as the camomile, burdock, &c.; 3rd. Demulcent, as the mallows, lint, &c.; 4th. Tonic, as the sea-holly, betony, &c.; 5th. Diuretic, as the taraxicum, broom, &c.; 6th. Astringents, as the barberry, avens, &c.; 7th. Cathartic, as the hellabore, buckthorn, &c.; 8th. Anthelmintic, as wormwood, shield-fern, &c.; 9th. Carminative, as fennel, carraway, &c.; and 10th. Rubefacient, as mustard, resin, &c. He then described the various plants composing the medicinal flora, arranging them according to their natural classification, indicating their relative abundance throughout the United Kingdom, and distinguishing them into such as were—1. Natives, or true aborigines; 2. Denizens, or such as are well-established importations within the historical period; and 3. Aliens, or importations not fully established.

4th August, 1869.—The Honorary Secretary read a paper "On the Vapour Bath," by Surgeon Lamprey, 67th Regiment, in which the author described the apparatus of Dr. H. Lee for administering mercury by this means, and entered fully into the advantages of the method of treating particular forms of disease. He detailed a very simple mechanism, extemporized by himself, for administering medicated vapours, which acted quite as well as that of Dr. Lee's, and had the additional merit of being much less expensive.

Dr. Evans, late Senior House Surgeon in the Royal Portsmouth (Civil) Hospital, read a paper "On the Operation of the Contagious Diseases Act in Portsmouth," in the course of which he remarked that Lock wards were first established in that hospital as far back as 1856, six beds in which were occupied by patients voluntarily applying for relief, but that so slight was the effect produced upon the prevention of disease by this arrangement, that so lately as the first half of 1867, more than 50 per cent. of those who under the Act were subjected to examination were found to be diseased. Since that time, however, a marked decrease had taken place in the prevalence of disease among men as well as among women in Portsmouth and Gosport; and the type of that which prevails is much less severe than it was prior to the Act being enforced. He had no means of estimating the number of women who in former years would have come under the Act had it existed, but at the present time their proportion in these towns is only a fraction under 5 per 1,000 of the general population, and that about one-seventh of all are suffering from disease. He gave many interesting particulars with regard to the class of persons to whom his observations applied; he entered into the causes which led, in the first instance, to the downfall of those women; stated the particular period when their liability to disease was greatest; and gave some statistics of the manner in which women whose history could be traced were disposed of on being discharged from hospital. He suggested that the younger women should be more completely separated from the older, by which arrangement he considered that moral influence would be more effectually exerted upon them than is practicable while they remain among their more hardened sisters. He also thought that small wards, capable of containing four or five patients, are better suited to the purposes of a Lock hospital than those capable of containing more considerable numbers.

APPENDIX NO. XXIV.

ARMY MEDICAL SCHOOL, NETLEY.

THE 18th Session, or Summer Session, of 1869, was attended by 20 candidates for the Indian Medical Service.

The order of precedence in which the candidates for the two services were eventually arranged to be gazetted was fixed according to the combined results of the two examinations, and is shown in the list which follows.

The questions put at both examinations at Chelsea and Netley are also given.

EIGHTEENTH SESSION, SUMMER, 1869.

Combined Results of the Chelsea Examination in February 1869, and of the Netley Examination in August 1869.

Order of Merit, as finally settled.	Names, arranged in Order of Merit for both Examinations.	Total Number of Marks (Maximum, 6,900).	Order of Merit, as finally settled.	Names, arranged in Order of Merit for both Examinations.	Total Number of Marks (Maximum 6,900).
1	Calthorp, C. W. ..	5,753	11	Linton, H. J. ..	4,255
2	Wood, A.	5,668	12	Peters, C. T. ..	4,177
3	Sanders, R. C. ..	5,455	13	Roberts, H. P. ..	4,138
4	Sanders, E.	5,015	14	Calson, E.	4,070
5	Franklin, B. ..	4,895	15	McRury, O. W. .	4,025
6	Edis, F. P.	4,888	16	Murphy, M. E. ..	4,021
7	Wright, R. T. ..	4,886	17	Price, W.	3,938
8	Davis, G. McB. ..	4,856	18	Tyrrell, S. M. ..	3,921
9	Gufla, K. P. ..	4,853	19	Boalth, W. H. ..	3,863
10	Howell, J. A. ..	4,501	20	Backhouse, J. ..	3,703

CHELSEA EXAMINATION, FEBRUARY 1869.

ANATOMY AND PHYSIOLOGY.

1. Describe the boundaries of the cavity of the tympanum, the various openings and processes observable on them, and the parts contained within the cavity, including the nerves, traversing or in immediate relation with it.

2. Give the origin and insertion of the following muscles:—

Circumflexus palati,
Constrictors of the pharynx,
Extensor indicis,
„ ossis metacarpi pollicis,
Flexor longus pollicis pedis,
Rectus abdominis,
Serratus magnus,
Quadratus lumborum.

3. Describe the situation and immediate relations of the spheno-palatine ganglion, the nerves joining or proceeding from it, their distribution and connections.

4. Give a full account of the situation, relations, structure and physiological functions of the duodenum and pancreas.

5. Describe the minute structure of the retina; state the point at which it is most sensible, and that at which it is insensible to the impression of light; and state the mode in which the latter can be shown experimentally.

Surgery.

1. Describe the symptoms of a case of axillary aneurism, and the operation of tying the subclavian artery at the outer third of its course.

2. By what symptoms may a case of syphilitic lepra be distinguished from one of simple origin? What treatment should be pursued in a case of the former variety?

3. A man, in falling down stairs, fractures the sixth and seventh cervical vertebræ, and much injures the spinal cord: describe what symptoms would be observed in such a case; what treatment should be pursued; and what pathological conditions, local and general, would be found after death?

4. What will be the symptoms of rupture of the urethra, the result of external violence? What treatment should be adopted? What is the usual condition of the urethra subsequently?

5. State the circumstances which would induce you to excise a joint, rather than amputate above it. How would you perform the operation of excision at the elbow-joint, and subsequently treat the limb?

6. Describe the treatment to be pursued in a case of suspended animation from drowning. What are the pathological conditions usually met with in a fatal case?

Medicine.

1. What are the chief affections of the membranes of the brain, in children and adults? Describe a case of acute hydrocephalus in a child, and state what treatment you would adopt.

2. Describe the eruptions seen in the following diseases: smallpox, chickenpox, measles, scarlet fever, enteric fever, typhus. State the periods of the disease when the eruptions appear and disappear, and mention what inferences as to the severity or prognosis of the case can be drawn from them.

3. What are the cardiac symptoms and signs which may occur in rheumatic fever? After mentioning these, follow up a case in which the aortic valves have been seriously injured, and describe what will probably be the future progress of the disease.

4. What are the causes of bleeding from the stomach, and what treatment would you employ in the instances you name?

5. What are the chief medicines which can be employed through the agency of the skin or subcutaneous tissue, either by simple application, friction, or subcutaneous injection? What effects are produced in each case? (The use of baths, or surgical appliances, is not to be included in the answer.)

6. What are the signs of pregnancy, and the chief disorders occurring in its course? Under what circumstances would you induce premature labour?

Natural History and Physics.

1. Zoology.

1. Describe the principal modifications of the structure of the vertebral column in the different classes of vertebrate animals.

2. Give an account of the development of a frog.

3. Enumerate the principal aquatic mammals, stating their chief peculiarities, their relation to terrestrial mammals, and their geographical distribution.

4. What are the chief modifications of the eye in the animal kingdom?

5. Give a general account of the fauna of Asia.

2. Botany.

1. Describe the structure of the vegetable ovule, and explain the terms anatropous, campylotropous, orthotropous, hilum chalaza, micropyle.

2. Give the characters of Leguminosæ, and mention the most important useful products yielded by that order, giving in each case the name of the plant, the use of the product, and the part used.

3. Give the characters of exogenous wood. How does the wood of conifers recede from the ordinary type of structure?

4. What is a compound fruit? Describe the fruit of the pine-apple, fig, and mulberry.

5. What are the geographical and climatic conditions which regulate the area of cultivation of the vine, wheat, maize, olive, potato?

3. Physics, &c.

1. Give an account of the solar system, stating the number and relative size of the planets, their distance from the sun, and the length of their orbits.

2. What is the atmosphere? Why does it vary in density at different elevations? Explain the barometer.

3. What is the cause of the change of seasons; and of the difference in the length of day and night at different seasons?

4. Give a sketch of the physical geography of Asia, its great ranges of mountains, and the course of its principal rivers.

5. What is chalk geologically and physically? How is it supposed to have been produced?

NETLEY EXAMINATION, AUGUST 1869.

Held at the close of the 18th Session of the Army Medical School.

A. Written Examination.

1.—Pathology.

1. The hydatid echinococcus cysts, the tapeworm (medio-canellata), and the guinea-worm, being the most frequent of parasitic diseases amongst soldiers, give an account of the natural history of each and all the forms of these parasites, stating the sources of each, showing how they obtain access to the human body, as well as to the body of animals, and how they reach the sites in which they are severally found.

2. Give an account of the lesions in the aorta which seem to precede and to favour the development of thoracic aneurism.

3. Private A. B. (104th Regiment), aged 36, had completed 15 years and 10 months of service, and was admitted to Netley from shipboard from India. He had been 100 days on the voyage. He was admitted on the 19th of May, and died on the 12th of June, 1869. His service is as follows:—July 1854 to November 1854 in England; from November 1854 to June 1856 at Gibraltar and in the Crimea; from June 1856 to February 1858 in England; afterwards in India. During his service in India he suffered from continued fever, from gonorrhœa, and from diarrhœa. He was finally attacked by dysentery in January 1868, and, because so debilitated, he was sent home as an invalid to Netley. He improved during the first part of the voyage home, but after passing the Cape he relapsed, and was landed in a condition of great exhaustion and emaciation. The discharges from the bowels, during his treatment at Netley, varied from five to ten motions daily. The pulse was weak, sometimes intermittent, and during the last fortnight of his life, ranged from 90 to 110. The motions, always loose, increased to eight or ten daily, of a brown colour, emitting the characteristic dysenteric odour. They were passed without tenesmus. He died greatly emaciated and exhausted; the body weight being only 76 lbs. in a man of 69 inches high.

Describe the condition of the following parts :—

1. Glands at base of tongue, and the tonsils.
2. Colour and consistence of the mucous membrane of the small gut.
3. Colour and condition of the several regions of the great gut, as to thickness, thinness, or ulceration.
4. Condition of solitary glands.
5. Condition of liver, especially as to capsule and substance.

Write a commentary on the case in relation, especially—

1st. To the *post-mortem* evidences of malaria.
2nd. To the results of the dysenteric attack.
3rd. As to the *post-mortem* appearances in the liver.

II.—Hygiene.

1. What are the points of importance in judging of the purity of water for drinking? What diseases are believed to arise from impure water, and what are the best methods of purification?

2. What is the standard of purity of air? What are the reasons for such a standard, and for expressing it in terms of carbonic acid?

3. What are the conditions of soil which have been supposed to be favourable to the development or prevalence of phthisis, typhoid fever, and cholera? What are the conditions of soil supposed to have been instrumental in causing the late outbreak of fever at the Mauritius?

4. What are the chief physiological effects of exercise? What amount of exercise is demanded from the Infantry soldier? What is the *length* of an ordinary march? What weight does the soldier carry in heavy marching order, and in what manner should the weight be disposed? What effects may result from ill-arranged accoutrements and dress?

III.—Military Surgery.

Gunshot Wounds of Joints.

1. Describe the features which distinguish a gunshot wound of a joint from an incised or punctured wound of a joint.

2. Describe the surgical steps to be taken in field practice for the treatment of gunshot wounds, both uncomplicated and complicated wounds, of the several joints named in the margin.* Explain the motives which determine your decision in each case in which you consider the best treatment to be amputation, excision, or the adoption of conservative measures.

[Note.—Frame your replies respecting the several joints included in the question under distinct headings, and in the same order in which they have been placed in the annexed list.]

Optical Examination of the Eye.

1. Explain the principles on which the diagnosis of emmetropic, myopic, and hypermetropic vision by means of a convex lens is founded.

2. Describe the process by which the degree of myopia and hypermetropia may be determined by a convex lens.

[Note.—Write an example in illustration.]

3. What conditions determine the nearest, and what the most distant, points of distinct vision of an eye?

IV.—Military Medicine.

1. Private A. B., — Regiment, aged 35; home service, five years; foreign service, eight years; family history good. Present state :—

* *a*, Shoulder-joint; *b*, Elbow; *c*, Wrist; *d*, Hip; *e*, Knee; *f*, Ancle.

Is emaciated, and has a listless and dispirited appearance; complexion muddy, eyes discoloured and expressionless, lips bloodless.

Muscular System.—Wasted, soft, flabby.

Respiratory System.—Normal.

Circulatory System.—Heart's action feeble; a soft systolic murmur audibl in cardiac region in the recumbent position, which cannot be heard when the patient stands.

Digestive System.—Appetite impaired, digestion imperfect, prone to diarrhœa from slight causes; spleen and liver are enlarged, the former can be felt and seen to extend into the pelvis.

Urinary System.—Urine contains albumen, but no tube casts. The blood, when examined under the microscope, is deficient in red corpuscles. The patient, unless warmly clothed, finds it difficult to maintain his natural temperature, and is liable to attacks of ague, particularly in wet and cold weather.

Diagnose this case. Give an intelligent commentary on the symptoms and appearances, adding your prognosis, with reasons annexed, and lay down a rational plan of treatment.

2. Your attention having been called to pulmonary phthisis as a disease of armies, you are required to give—

(*a*) The causes which appear to operate in exciting this disease in military life, including the observed effects of climate, if any.
(*b*) the form of the disease usually met with in the Army;
(*c*) the means of early diagnosis;
(*d*) general principles of rational treatment.

3. Describe—

(*a*) the different forms of insolation;
(*b*) the sequels of this affection;
(*c*) the treatment, including that of the most common of its sequels.

B. Practical Examination.

Military Medicine and Surgery.

Examine the case of

Write concisely a history of the case,—your diagnosis, prognosis, the probable effects of treatment, and the influence of the disease (or injury) on the man's fitness for service as a soldier.

Military Hygiene.

(*a*) Examine the specimen of water before you,—as much as can be done in the time.

(*b*) Determine the amount of gluten (weighed wet).

(*c*) Examine the flour before you, chemically and microscopically.

Pathology.

1. Examine the portions of tissue placed in the dishes. State of what organ each is a part, and describe its morbid condition.

2. Describe the lesions shown in the preparations numbered 1, 2, 3, 4. State what parts are shown in the preparations. Describe the lesion, or lesions, which are illustrated, and the probable stage of the disease to which it corresponds.

3. Determine the magnifying power of any one of the microscopes, and append the scale used.

Describe and name generally what you see in the fluid contained in the test tubes, examined under the highest power.

5. Name each of the preparations placed under the microscopes on the table.

EXAMINATION OF ASSISTANT SURGEONS FOR PROMOTION.—MARCH 1869.

Military Medicine.

1. Give the most complete account you can of the affection known as locomotor ataxy. A careful diagnosis is required between this disease and paraplegic affections.

2. Give the etiology, symptoms, diagnosis, prognosis, and treatment of delirium tremens. A distinct statement of your opinion on the use of opium and stimulants in the treatment of this affection is required.

3. Describe suppurative inflammation of the liver, its etiology, modes of termination, diagnosis, and treatment. A precise statement of your opinion, the result of experience, on operative interference is required, and your views on the modes of evacuating abscess of the liver without admitting air into the cavity.

Military Hygiene.

1. What is the present death-rate of the Army serving at home; what diseases make up the chief items of the mortality, and what do you conceive to be the principal causes of these diseases?

2. What are the usual sanitary precautions adopted when cases of either typhoid fever, scarlet fever, or cholera occur in a barrack?

3. What is the usual length and rapidity of marches, and what weight is a man serving at home supposed to carry in full marching order? What are the usual sanitary precautions to be adopted at home or abroad during marches extending over several days?

Military Surgery and Surgical Anatomy.

1. Describe the symptoms of the following forms of iritis:—

(*a*) Simple idiopathic iritis,
(*b*) Serous iritis,
(*c*) Suppurative iritis,
(*d*) Syphilitic iritis,
(*e*) Traumatic iritis,

and mention the treatment to be adopted in each kind.

2. How many kinds of whitlow are there? How are they distinguished? How are they to be treated?

3. In what cases of gun-shot injury of the hip-joint would you practise excision? In what cases would you consider amputation at the articulation absolutely necessary? Has primary or secondary amputation at the hip-joint been followed by the greater proportion of recoveries?

4 What structures do you divide if you take away the foot by a section through the ankle-joint?

Pathology.

1. Give a pathological account of the nature of the fevers described as Maltese or Mediterranean. State in what respects they differ from British continued fevers; and what are the best methods of measuring or otherwise investigating and comparing the amount of febrile disturbance.

2. What are the elements and forms of texture which compose a fungus? Name the diseases in which fungi are known to take a prominent place in the lesion.

3. Give an account of the specific lesions seen in cases of typhoid fever.

APPENDIX No. XXV.

CIRCULARS, GENERAL ORDERS, &c.

HAVING REFERENCE TO THE MEDICAL DEPARTMENT FROM 1ST MAY, 1869, TO 28TH FEBRUARY, 1870.

1st. WAR OFFICE CIRCULARS.

Charge Pay—Medical Officers.

Clause 42. 1st May. 1869.

The certificate called for from General and other Officers Commanding by Clause 25, Army Circular, 1868, is dispensed with as regards Gibraltar, Malta, Canada, and the Cape of Good Hope.

Medical Pay Lists, Ration Returns, &c.

Clause 67. 1st June, 1869.

The Pay Lists and Ration Returns of the Medical Staff which have been heretofore prepared by the Purveyors' Department, under Articles 148 and 253 of the Purveyors' Regulations, will in future be made out in the Office of the Principal Medical Officer.

Hospital Accommodation, Home Service.

Clause 77.

In consideration of the improved sanitary condition of the Army, the Secretary of State has decided that in the future building or re-appropriation of hospitals, as well as in the arrangement of equipment for hospital service, the hospital accommodation for troops on home service shall be calculated at the reduced rate of 6 per cent. on the barrack accommodation.

Hospitals for Women and Children.

Clause 78.

1. The wives and families of non-commissioned officers and men married with leave and on the married roll of a regiment, and entitled to quarters, will alone possess a claim to admission to, and treatment in, women's hospitals at the public expense, under the following conditions.

Infectious Disease.

2. Cases of scarlet fever and variola, when occurring in barracks or huts, will always be admitted, with the view of preventing, or limiting, the spread of such diseases. All other infectious maladies will, as a rule, be treated in quarters, and will only be admitted on the order of the Principal Medical Officer, under circumstances which in his opinion justify a departure from the general rule.

Sufferers from infectious diseases will never be treated in hospital under the same roof with lying-in women.

General Disease.

3. Only cases of *serious and acute* disease are admissible, when in the opinion of the Principal Medical Officer, the nature of the cases, or the circumstances, are such as to justify their treatment in hospital, at the public expense.

Cases of chronic disease are *not admissible* without the sanction of the Director-General.

Parturient Cases.

4. The wives of non-commissioned officers and men, when occupying

wooden huts, will be entitled to admission for their confinements. When in quarters or in barracks they will also be entitled to admission except—

(*a*) When occupying two rooms;

(*b*) When occupying one room and without children.

General Regulations.

5. The wives and children of soldiers coming to hospital for admission will be required to bring a certificate, signed by the Officer Commanding, that the applicant is the wife or child of a soldier married with leave, and on the strength of a regiment, and entitled to quarters in barracks. These certificates will be filed for reference.

6. Others than the wives and children of soldiers on the Married Roll of corps are only admissible (paying the regulated stoppage), under exceptional circumstances, or when their removal from the public quarters occupied by them may be deemed necessary, as a matter of safety and protection in guarding the troops and their families against the spread of contagious disease.

7. The wives and families of soldiers married without leave, or not entitled to quarters, are *not admissible under any circumstances* to be treated at the public expense.

8. The Principal Medical Officer will, in future, at the end of every month, forward to the Director-General of the Army Medical Department a return (on W. O. Form 1020) of the patients treated in the women's hospital, affording at the same time, in the columns of remarks, any explanation that may be necessary especially as regards the admission of cases of general disease. This return is in lieu of that hitherto furnished monthly (on W. O. Form 26) to the Quartermaster-General, in accordance with paragraph 1484 of the Queen's Regulations.

9. The number of beds allowed by Treasury grant must never be exceeded, unless with the authority of the Secretary of State for War.

Forage, Apothecaries.

Clause 82. 1st July, 1869.

Apothecaries to the forces serving under the Royal Warrant of 23rd October, 1854, are not entitled to forage unless their horses be certified to have been necessarily kept for the public service.

Stoppages for Medical Comforts.

Clause 84.

1. The Secretary of State for War has, with the concurrence of His Royal Highness the Field-Marshal Commanding-in-Chief, approved of a modification of the provisions of Circular No. 916 with regard to the stoppages to be enforced for medical comforts supplied to soldiers not dieted in a military hospital.

2. In future the total stoppage for rations and medical extras to be made from soldiers thus situated, will not exceed the ordinary stoppage made from soldiers dieted in a military hospital, viz., 10*d.* a-day at home and 9*d.* a-day abroad; but, whenever practicable, any soldier thus treated will be struck off the ration list of the regiment or corps to which he belongs.

3. When, however, it is necessary that the soldier should continue on the regimental ration list, the Commanding Officer will be required to certify to the necessity for such a course, to support the charge in the public accounts of the actual cost of the regimental messing, exclusive of the ordinary bread and meat ration.

Emptying Cesspits and Ashpits, Sweeping Chimneys, Supply of Lime and other Disinfectants.

Clause 101. 1st August, 1869.

1. The necessary provision will be made by the Control Department for these services, which will continue under the supervision of the troops in occupation of barracks as provided for in Articles 941 and 943 Queen's Regulations.

2. Paragraph 61, Clause 47, Army Circulars 1869, is hereby cancelled.

Disinfectants in cases of Emergency.

Clause 102.

1. In all cases of emergency (except in the case of cholera, for which special provision has been made in the Instructions issued thereon with Clause 83, Army Circulars 1867), when the use of disinfectants is recommended by the Principal Medical Officer of the District, and approved by the General Officer Commanding, carbolic acid in powder will be employed if practicable, and the supply will be immediately ordered by the Controller, who will forward the Medical Officer's explanation of the circumstances, and a copy of the requisition, for the covering sanction of the Secretary of State for War.

2. Clauses 92, Army Circulars, 1867; 109, Army Circulars 1868; and 38, Army Circulars 1869, are hereby cancelled.

Annual Returns of Sickness and Mortality.

Clause 105.

1. Considerable inconvenience having arisen from delay in the transmission of the annual returns of sick and wounded (W. O. Form 298), the attention of Medical Officers is specially called to the instructions contained in the Medical Regulations, page 93, relative to the transmission of their annual returns and reports on or before the 31st January.

2. Principal Medical Officers are requested to see that this regulation is complied with, and to transmit these documents, with their General Summary and Report, as early in each year as possible, to facilitate the preparation of the annual volume of reports.

Stationery.

Clause 119. 1st September, 1869.

1. Attention having been called to the large supplies of stationery expended in Staff and Departmental Offices, it has since been decided to reduce the number of articles issued at the public expense; and accordingly, in future, only those articles enumerated in the revised W. O. Form 832 (printed in the Appendix to this Clause) will be supplied.

2. Demands for stationery (on the revised W. O. Form 832, copies of which will shortly be issued to officers concerned) will be made annually, for the year ending 31st March, and transmitted to the Under Secretary of State for War in time to ensure their arrival at the War Office on or before the undermentioned dates:—

From China and Japan	1st September.
„ Australia and New Zealand	
„ Ceylon and Straits Settlements	1st October.
„ Mauritius	
„ Cape of Good Hope	1st November.
„ St. Helena	
„ West Africa Settlements	
„ West Indies	1st December.
„ British North America	
„ Malta and Gibraltar	1st January.
„ Home Stations	1st February.

3. It will be distinctly understood that stationery is demanded for service of the year succeeding that in which the requisition is made, and it is therefore not due at the station until the first day of the following April.

4. Stationery is furnished to offices and not to individuals. Every serviceable article will therefore be left in the office for which it is supplied, and handed over to his successor by an officer quitting a station or office.

5. The quantity of every article remaining on hand at the date of making the demand must be shown, whether a supply is required or not, each column must be *completed* as regards receipts and expenditure, and a complete list given of the persons for whom supplies are demanded.

6. The maximum allowance per annum of the undermentioned articles will be as follows:—

For each person—

Pens	Steel barrel or Steel nibs or Quill	4 dozen, with 4 holders. 1 gross, with 4 holders. 100
Lead pencils	....	4
Blotting paper	....	4 quires.

7. It will be left to the Heads of Departments to distribute supplies to their subordinates, in such proportions as may best meet the wants of the public service.

8. The following will no longer be supplied as articles of ordinary office stationery, viz. :—cartridge, plain demy, and quarto papers, mill boards, cards, marking brushes, imperial calendars, needles, pins, wafers, wire files, paper folders, portfolios, erasers, clasp knives, scissors, strops, and flat rulers. Printed forms and books, school materials, and drawing materials, will be demanded on the forms of requisition provided for that purpose.

9. The strictest economy will be exercised in the use of all articles of stationery supplied. Letters on the public service, when they occupy one page only, may be written on half sheets of paper. When demands are unusually large, cause should be assigned ; otherwise the supply will be reduced.

10. Local purchases of stationery will in no case be made without the authority of the War Office being first obtained.

Hospital Orderlies.

Clause 123. 1st October, 1869.

1. Orderlies will be appointed in the proportion of three for a battalion of infantry or a regiment of cavalry, and one for every battery of artillery.

2. Should the number of sick exceed ten for each permanent orderly, additional orderlies, with pay, at the rate of one for ten patients, may be employed if requisite ; an additional orderly being allowed whenever there are at least five patients over the ten or multiple of ten. In case of emergency, however, the Medical Officer in charge will have the power to require that there shall be sufficient attendance for the sick at all hours of the day and night irrespective of the limitation above laid down.

3. In the case of brigades of artillery where several batteries are serving together and their sick are treated in one hospital, only as many of the permanent hospital servants as are necessary according to the above-mentioned proportions for the aggregate number of sick will be retained on duty at the hospital.

Forage Allowance.

Clause 126.

The rule which requires that a horse for which forage or forage allowance is issued shall be *bona fide* the property of the officer is relaxed. In future the only conditions which will be required are that the horse is effective, and is *bona fide* kept by, and entirely at the disposal of, the officer.

Disposal of Useless Documents.

Clause 134.

Attention having been called to the large accumulations of obsolete War Office Forms and other documents in military offices, the Secretary of State for War desires that all useless documents may be at once disposed in accordance with instructions contained in War Office Circulars Nos. 235 and 790.

Filters for the Purification of Water.

Clause 135.

The Secretary of State for War has directed that a Report made to him by the Army Sanitary Committee on the purification of water for the use of the troops, shall be published for the general information of the

Army. The Report in question is accordingly printed as an Appendix to the present Army Circular.

Appendix to Clause 135.

The Army Sanitary Committee, after a lengthened inquiry into the capabilities of various patent filters for the use of troops, the experimental part of which has been carried out at the request of the Committee by Dr. Parkes, beg to submit for the information of the Secretary of State for War the following practical conclusions at which they have arrived :—

1. The different filters of private makers submitted to experiment all exercise a greater or less purifying power on water. They all remove suspended impurities. They all oxydize more or less effectually hurtful organic matter held in solution. They all appear to remove a certain amount of dissolved salts to which the hardness of water is due.

2. But this purifying power is not of indefinite duration, on the contrary, it deteriorates in proportion to the impurity of the water to be filtered, or in proportion to the amount of water passed through the filter, and after a time, if the filter continues pervious, a certain portion of the impurity already in the filtering material is dissolved in the water and passes with it out of the filter, so as apparently to increase its impurity.

3. That all the filters after a time become clogged, and either discharge very slowly or not at all.

4. This clogging depends partly on suspended impurities and on organic matter, partly on lime or other salts. Organic matter can be more or less removed by passing a solution of permanganate of potash through the filter to oxydize it. The salts may be diminished by washing with pure water, or by passing a weak acid solution through the filter. But in practice all these filters require to be cleansed, or to have the filtering material taken out and replaced by persons practically conversant with their construction.

5. Such being the case, the Committee are not prepared to recommend any of these filters for use at foreign or Indian stations. The amount of care required for cleansing and keeping them in efficient order (without which filters would be worse than useless) would, in the opinion of the Committee, be practically unattainable, while the cost of returning filters for cleansing to the makers would be far too great to be incurred.

6. Wherever water can be filtered and stored on the large scale, the fixed sand filters advised for adoption by the Committee in their suggestions for the sanitary improvement of Indian stations, if properly constructed and cleaned periodically, or renewed if necessary, would be found sufficient.

7. That the present question regarding filters applies specially to providing an economical, efficient, easily constructed, and easily cleansed filter for hospital and barrack-room use, and, in the opinion of the Committee, such a filter can be made at any station under superintendence of the Engineer, provided the following simple principles are kept in view.

8. The experiments made by Dr. Parkes have shown :—

That fine sponge, if used as a filtering medium, arrests almost entirely the suspended matter in water, whilst sponge admits of easy removal, cleansing (by washing), and replacing.

That clean sand and charcoal have a direct oxydizing power on dissolved organic matter, and they likewise admit of easy removal, cleansing, and renewal when necessary.

That by making use of these properties, filters can be constructed of any convenient vessel, but that probably in practice each filtering substance had better be placed in its own vessel, the vessels being arranged one over the other, for facility of cleansing and renewal.

9. This application may perhaps be more easily illustrated by reference to vessels already in use at Indian stations : thus,

The filter for a hospital ward or barrack room might consist of—

(*a*) A narrow-necked large earthen jar placed on the ground to receive and contain the filtered water.

(*b*) Over this jar might be placed, in a convenient frame, a globular earthenware vessel with an open mouth and a hole in the bottom fitted with a sponge. The half of this vessel to be filled with small pieces of charcoal made of light porous wood.

(*c*) Over this charcoal vessel a second similar vessel with the bottom hole fittedwith sponge to be placed; this vessel to be half filled with clean sand.

(*d*) An upper vessel similar to the others with the bottom hole fitted with sponge of the finest texture.

10. The action would be as follows:—

Water to be filtered would be poured into the upper vessel. It would (if the sponge were clean and properly inserted into the bottom hole) be deprived of its suspended impurities, and would pass into the second or sand vessel clear, but containing dissolved substances, including organic matter. In passing through the sand the water would be deprived of a certain amount of both impurities, and would pass through the second sponge into the third or charcoal vessel.

In passing through this portion of the filter the water would become sufficiently pure for use, provided it were fit for use at all.

By a simple arrangement it would be possible to protect the water in the recipient from the bad effects of impure air, or other impurities, during and after the process of filtration.

11. As already stated, all filtering media only act for a time, and the best judge of the necessity for cleansing or renewing the filtering media would be the Medical Officer, who could ascertain with great ease the state of the filter by very simple tests. It should be the duty of the Medical Officer to see to this, and filters requiring it should be cleansed by careful washing, or by renewal of the filtering media regimentally under the direction of the Medical Officer.

Lastly. The Committee do not consider it necessary to do more than indicate in this general way the application of the conclusions arrived at in this inquiry. The details should be left to the authorities at each foreign or Indian station where water filters of this class may be required.

Damages by Lunatics.

Clause 139. 1st November, 1869.

1. Damages to buildings or stores, committed by lunatics or patients temporarily insane, and unaccountable for their actions, except in cases of patients suffering from delirium tremens, will not be charged against the troops at inspections.

2. The necessary repairs to stores so damaged will be authorized by the Controller without reference to the War Office.

3. In the event of articles being burnt, lost, or so damaged as not to be repairable, the Controller will not sanction such articles being struck off charge, unless the inspection report be accompanied by a certificate from the Surgeon in charge, approved by the Principal Medical Officer, certifying that no blame is attributable to a hospital attendant.

4. In the case of articles which are so damaged as not to be repairable, a certificate from a commissioned officer showing in what way the articles have been disposed of will also be annexed to the report.

Requisitions for Stationery, &c.

Clause 152.

1. Requisitions for stationery, War Office Forms and books, Bibles and Prayer Books, drawing materials, and latrine paper, hitherto sent direct to the War Office by Staff, Departmental, or Regimental Officers, will in future be forwarded to the local Controller for transmission in time to reach the War Office on or before the dates undermentioned:—

From China and Japan, Australia and New Zealand	1st Sept.
„ Ceylon, Straits Settlements, and Mauritius	1st Oct.
„ Cape of Good Hope, St. Helena, and West Africa Settlements..	1st Nov.
„ British North America and West Indies....	1st Dec.
„ Malta and Gibraltar	1st Jan.
Home Stations	1st Feb.

2. These demands will be made annually for the year ending 31st March, and it will be distinctly understood that supplies are not due at the station until the 1st April following the date of requisition.

3. The Controller will include in one demand the supplies required for all branches of his department, and will examine all requisitions from his own and other departments to satisfy himself that they are made out in accordance with existing regulations, and the instructions printed on the revised forms of demand, copies of which will be forwarded to officers concerned.

4. If approved, demands will be passed to Her Majesty's Stationery Office for supply of the necessary articles, which will be separately packed for each department, and forwarded in one consignment to the Controller at the station, who will cause the packages to be delivered as addressed.

Medical Comforts.

Clause 20. 1st January, 1870.

1. The Secretary of State for War has approved of soda water being issued to patients in Army hospitals, in cases when the issue is specially approved by the Principal, or, in his absence, the Senior Medical Officer of the Command.

2. The use of bottled lemonade is prohibited. When fresh lemons cannot be obtained, lemonade should be prepared from lime juice, in the proportion of 2 ozs. of the juice to 1 pint of the beverage.

Medical Aid—Woolwich Arsenal.

Clause 21.

1. The Secretary of State for War having had under consideration the regulation laid down in Article 2 of W. O. Circular 809, which limits the grant of medical aid to persons residing within a radius of one mile of the Staff Dispensary, or of the Hospital of the station, has been pleased, in regard to the Royal Arsenal, Woolwich, to issue the following regulations for that station :—

2. Medical aid will henceforth be granted—

(*a*) To persons entitled thereto, who reside within one mile radius of a point equidistant from the Main and Plumstead Gates of the Royal Arsenal, as shown by a yellow semicircle in a plan of Woolwich District, to be seen in the offices of the Heads of Departments, Royal Arsenal, such medical aid being afforded by the Medical Staff of that establishment.

(*b*) To persons similarly entitled who now reside within the radial line drawn from the Dispensary of the Royal Arsenal, and coloured red in the plan already named, and which was the limit hitherto in force ; but no one hereafter taking up his residence outside the new radius can be afforded medical aid.

Disposal of Useless Books, &c.

Clause 22.

1. The Secretary of State directs that useless books, forms, &c., be not allowed to accumulate. Should any great accumulation at present exist in any Regimental or Staff Military Office, steps will immediately be taken for a clearance being made in the manner laid down in these Regulations.

2. Before books or documents are condemned as useless, the officer at the head of each office will forward to the War Office through the local Controller, a full list thereof, showing the following particulars :—

1. The description of the books or documents.
2. The periods to which they apply.
3. The reasons in each instance for the books or documents being considered no longer necessary.

The Secretary of State for War will then decide as to the retention or destruction of the books or documents in question.

3. All books, forms, and documents condemned as useless, as also old paper, and other worn-out articles of stationery (excepting old bottles and pens) both in Staff and Departmental Offices, will from time to time, under orders from

the local Controller, be delivered over to the Store Department by the several Heads of offices.

4. Controllers will, however, on no account permit the Store Department to take charge of condemned books, documents, &c., until a notification is received from the War Office that the condemnation has been authorized by the Secretary of State for War.

Nursing Service at Netley.

Clause 33.

Regulations for the Nursing Service at the Royal Victoria Hospital, Netley, are issued with the present Army Circular for the information of officers and all concerned:—

Regulations for the Nursing Service at the Royal Victoria Hospital, Netley.

Nursing service.

1. The Nursing Service at the Royal Victoria Hospital, Netley, will consist of a Superintendent, Nursing Sisters, Wardmasters, and Orderlies.

Age of Superintendent.

2. The Superintendent shall not continue in the service after she has attained the age of 60 years.

Pension of Superintendent.

3. On retiring at the age of 60, the Superintendent will be allowed a pension at the rate of 50 per cent. of her pay at the time of retirement.

Should the Superintendent be obliged to leave the service on account of disability, certified by two Medical Officers, she shall (provided she has served for 12 full years) be entitled to a pension equal to 20 per cent. of her pay at the end of the twelfth year.

If the Superintendent retires from disability at any period after 12 years, and before she arrives at the age of 60 years, her pension shall be 20 per cent. of her pay, with the addition of 2 per cent. of her pay for every full year above 12 years she has served.

In any case, while in the receipt of a pension, she may be called on for service in the event of her disability ceasing, when her pension will be discontinued, and her pay recommence as before.

If the Superintendent is obliged to leave the service from disability, certified by two Medical Officers, before she has completed 12 full years of service, she will receive a gratuity according to the circumstances of the case.

Allowances of Superintendent.

4. The Superintendent will be allowed mess money at the rate of 9*s.* 6*d.* a-week, and washing money at the rate of 1*s.* 6*d.* per week, or at such rates as the Secretary of State for War may hereafter determine.

Superintendent's servant.

5. The Superintendent will also be allowed a servant, whose duty it shall be to cook for the Superintendent and Sisters, to wait upon the Superintendent, to clean the quarters of the Superintendent, the linen stores and nurses' day room, and when required, to scrub the Sisters' quarters. Ration money and washing money (at the same rate as for the Sisters), and wages will be allowed to the Superintendent for the servant.

Sisters' allowances.

6. The sum of 9*s.* 6*d.* per week as ration money, including therein the following allowance of beer and porter or wine, and 1*s.* 6*d.* per week as washing money will be allowed to the Superintendent for each Sister. Each Sister will be allowed per diem, one pint and a-half of porter or ale, or, in lieu of half a pint of porter or ale, a wine-glass of wine at the discretion of the Superintendent. These rates are subject to revision hereafter.

Nurses' quarters.

7. The quarters of the Superintendent and Nursing Staff will be confined to their sole and exclusive use.

Responsibility of Superintendent.

8. The Superintendent is responsible directly to the Secretary of State for War for the efficiency of the nursing establishment.

Nursing duty of Superintendent.

9. The Superintendent shall herself personally take an active share in all nursing duties, both by night and by day. She shall bear in mind that certain night superintendence of the sick devolves upon herself, also, among other such duties, superintending the service of the Sisters at operations at which the Sisters' attendance has been required by the Medical Officers; also of sick newly arrived, of sick becoming suddenly worse, and in emergencies of sending for the Medical Officer.

Appointment of Sisters.

10. The Superintendent will select, and with the sanction of the Secretary of State appoint, the Sisters.

11. All complaints against the Superintendent are to be transmitted through the Commandant to the Secretary of State, and copies of all such complaints are to be delivered by the Commandant to the Superintendent on the same day that he transmits them to the Secretary of State. Complaints against Superintendent.

12. All complaints against the Sisters are to be made to the Superintendent direct, and on receipt of any complaint the Superintendent will forthwith make enquiry into the same. Complaints against Sisters.

13. The Superintendent will receive the earliest possible information of the expected arrival of sick and invalids from the Commandant, and it will be her duty to take immediate steps in preparing the wards for their reception. Superintendent to prepare wards for sick.

14. Any orders of the day having reference to the Nursing Service will be immediately communicated to her. Orders of the day.

15. The Superintendent shall, in concurrence with the Principal Medical Officer, fix the hours of nursing duty in the wards. She shall allot the current duties of the Sisters; she shall keep a constant watch over their moral conduct; she shall see that they attend to their dress, cleanliness, and personal habits, and that they are on duty at the prescribed hours. Hours of nursing duty, &c.

16. The Superintendent shall satisfy herself that all nursing duties are discharged with faithfulness, consideration, and kindness, and for this purpose she shall visit the wards frequently, and note any negligence or incapacity. In such cases, or when she is informed by the Medical Officer of the ward of any neglect of duty or impropriety of conduct on the part of a Sister, she shall privately reprimand the Sister, and issue directions for preventing similar defects in future. Superintendent to watch over nursing.

17. The Superintendent should report on the state of efficiency of the nursing once a year to the Secretary of State for War, and in order to enable her to do this copies of all reports, confidential or otherwise, which may have been made to the Secretary of State, or to the Army Medical Department regarding the Nursing Establishment, will be transmitted to her on application. Superintendent to report annually.

18. Pay, wages, mess money, and washing money of the Superintendent, the Sisters, and the Superintendent's servants will be paid to the order of the Superintendent, who shall pay the wages and other expenses of the Sisters, and account for all money received by her to the Paymaster. Superintendent to receive wages, &c., and to account for them.

19. In case the Superintendent or a Sister, be placed on sick diet, medicines, wines, and spirits will be supplied from the hospital stores, on the requisition of the Medical Officer appointed from time to time to attend on the Nursing Staff, and will be in addition to the regular allowance for rations. Extras and medical comforts in sickness allowed.

20. The Superintendent shall keep the books and accounts connected with the Nursing Staff of the hospital. Superintendent to keep books.

21. The Superintendent shall make up the annual estimates of the cost of the Nursing Establishment, and transmit the same to the Secretary of State for War. Superintendent to prepare annual estimates.

22. The Superintendent shall be responsible for the storing, mending, and distribution of the linen, for which purpose sufficient assistance will be provided by the Commandant. She should return to the laundry any linen not properly washed or dried, and report the circumstance to the Captain of Orderlies. She shall have an assistant ranking in all respects as a Ward Sister, to be called "Linen Sister," to take charge under her of the linen. Superintendent responsible for linen.

The Linen Sister shall have nothing to do in the wards. Linen Sister.

23. The Superintendent may suspend any Sister for neglect of duty or for misconduct, and provide temporary assistance, but in every such case she must notify the fact forthwith through the Commandant to the Secretary of State for War, stating distinctly the reason for the suspension and the qualifications of the assistant. No sister, during her suspension, shall be permitted to enter any ward in the hospital. Suspension of Sisters from duty

24. When the Superintendent considers it necessary to dismiss any Sister from the service, she must notify the fact through the Commandant to the Secretary of State for War, stating distinctly the reasons for dismissal, and she may dismiss and send away any Sister with the sanction of the Secretary of State previously obtained. Any sister so discharged will only be paid to the date of her discharge or previous suspension. Dismissal of Sisters.

25. No Sister discharged for misconduct of any kind can be re-engaged for Discharged Sisters not to be re-engaged,

Her Majesty's service, and any Sister retiring from the service without previous permission from the Superintendent will forfeit all claim to pension or re-engagement in the public service.

Sisters not to accept presents.

26. Sisters are not permitted to receive presents of any kind from any patient, or friend of any patient, whether during his illness, or after his death, recovery, or departure.

Age of Sisters on appointment.

27. Except for special reasons, to be notified to the Secretary of State, no Sister shall be appointed under 30 or above 40 years of age.

Age of Sisters on retirement.

28. No Sister shall continue in the service after she is 60 years of age.

Qualification of Sisters.

29. Every Sister must be able to write, and must produce satisfactory evidence of former good conduct and capability for fulfilling her duties.

Pay of Sisters.

30. Sisters will be allowed pay from the day of appointment at the rate of 30*l.* per annum during the first year, with an annual increase at the rate of 2*l.* additional every year until the pay amounts to 50*l.*, beyond which there will be no further increase.

Pension of Sisters.

31. A pension will be awarded to any Sister who is declared on the report of two Medical Officers, and on report of the Superintendent as absolutely unfit for hospital duty through disease or injury, provided she has been 10 completed years in the service.

The amount of such pension will be 40 per cent. of the pay received by the Sister in her tenth year of service. If the Sister has served more than 10 years the pension will be increased at the rate of 2 per cent. of the pay for every additional year of service, until the pension amounts to 70 per cent. of the pay received during the year preceding its grant, beyond which there will be no increase.

Every Sister retiring at the age of 60 years will receive her rate of pension in conformity with the preceding scale.

Any sister temporarily or permanently disabled in the service, who has served more than 5 and under 10 years, will be entitled to a lower rate of pension, according to the circumstances of each case. But if she has served less than 5 years she shall receive a gratuity according to the circumstances as reported by the Superintendent.

Any Sister pensioned for disability must present to the Superintendent an annual medical certificate of the state of her health before she receives her pension, and if called on for service, in the event of such disability ceasing, her pay will be the same as it would have been had she not been disabled; but should she decline re-entering the service her pension will cease.

In any case of special devotion to the public service the Superintendent may represent the circumstances to the Secretary of State, who may recommend that a higher rate of pension than that fixed by regulation may be granted, provided that no such pension shall exceed the annual amount of 50*l.*

Travelling expenses.

32. A Sister discharged from Service on account of ill health, certified by two Medical Officers, whether she may be in receipt of a pension or a gratuity, will be entitled to subsistence and travelling expenses to her own home.

Re-engagements.

33. Any Sister who has received a gratuity for disability incurred under five years' service, may be re-engaged in the nursing service should she apply for re-engagement and be found fit, and shall receive pay at the rate to which she was entitled at the period of her retirement.

Dress.

34. Sisters will be allowed, at the public expense, a badge and a regulation dress, in which they are always to appear, except on holidays, as follows:—Three good grey gowns, six aprons, six caps, six collars, one bonnet annually, one summer and one winter cloak triennially. Sisters dismissed for misconduct will forfeit the whole of their regulation clothing, which shall be returned to the Superintendent; and in the event of their leaving the service voluntarily, they may also be required to return all clothing supplied to them during the previous 12 months.

Sisters to clean their quarters.

35. Sisters shall make their own beds, and daily clean out their own quarters, but are not required to scrub floors.

Recreation and exercise.

36. The hour of recreation and exercise, as well as holidays, will be fixed by the Superintendent with reference to the ward and linen duties. Sisters are required to take frequent exercise in the fresh air.

37. No Sister must be out of hospital before or after the limits of her exercise time without the written permission of the Superintendent. Limits of ditto.

38. Sisters will receive visitors only on such days of the week and at such hours as may be specified by the Superintendent. Visitors.

39. Sisters should have eight hours for sleep, and whenever possible two hours daily for exercise or recreation. Time for sleep and recreation.

40. Sisters are responsible solely to the Superintendent, and are to conform to the directions of the Superintendent in all matters relating to the times and places of work, and generally to conduct and discipline. Responsibility of Sisters.

41. Every ward or set of wards, except venereal or convalescent wards, according to their size and number of patients, should be under a Sister. Allotment of wards.

42. Sisters are not to be required to serve in venereal or convalescent wards, nor are they to be employed for any other nursing service than in the general wards of the hospital. To nurse only in general wards.

43. The Sister is responsible for the condition of her wards. She shall keep the keys of all store-closets, all lock-up places which may be provided in the wards. Nothing appertaining to the wards is to be kept in the Sister's room. Ward duties.

44. The Sister shall enter on her ward duties day by day at such time as the Superintendent may appoint. She shall attend and render assistance at surgical operations when required to do so. Hours of nursing and operations.

45. The Sisters shall always attend the Medical Officers of the ward on their visits, and shall receive and obey all their orders regarding the administration of medicines and medical comforts, the preparation of tea, sago, arrowroot, or beef-tea, the administration of food and drink to helpless patients, the application of leeches and blisters, poulticing and minor dressings, the administration of enemas when required by the Medical Officers to do so, and the due warming and ventilation of the ward. Obdience to Medical Officers.

46. During the session of the Army Medical School, it is not necessary that the Sister should attend the Medical Officer while engaged in clinical instruction, unless permitted by him to do so; but the Sister shall always be sent for by the Medical Officer or Medical Cadet, who may be in immediate charge of the case, to receive their orders in cases where any change of management is deemed to be necessary, either during the clinical visits or at any other times. Attendance on clinical visits.

47. The Sister shall be responsible for the personal cleanliness of each patient, for the care and cleanliness of his linen, bedding, and utensils, for his personal obedience to the orders of the Medical Officers as to keeping his bed, or his position, &c. She shall see that the ward, its furniture and utensils, are cleaned, and the helpless patients washed by the orderlies before the morning visit. Duties as regards patients.

48. To fulfil these responsibilities, the Sister shall give such instruction to the orderlies in any of these details as she may consider necessary, and she shall require the orderlies in her ward to obey her directions in any of these matters; and in case of neglect or disobedience on the part of any orderly, or in case of any breach of discipline in a ward, or in case of swearing or the use of foul language by any patient or orderly, she shall report the same to the Superintendent, who shall lay the complaint before the Captain of Orderlies; but in an emergency the Sister, if she considers it necessary, may report directly to the Captain of Orderlies, or to the Medical Officer. Sisters to instruct orderlies, and to require obedience.

49. In order to save the time of the Sister, and to prevent breaches of discipline, all diets and ward requisites should be brought to the wards, or at least to the ward doors. Nothing should be fetched by the Sisters. Diets, &c., to be brought to wards.

50. The Sister shall conform to the hours of morning and evening poulticing, and minor dressings, fixed by the Medical Officer; also to the hours of administration of medicines and diets, notified in the ward or written in the ward-book. Sisters to conform to hours.

51. Patients who have been permitted by the Medical Officer to leave their wards must return to their wards at medicine-time and dressing-time. Patients to return to wards.

52. Medicines, wine, spirits, and malt liquors are always to be administered by the Sister in attendance, in conformity with the orders of the Medical Officers. Sisters to administer medicines, &c.

Demeanour of Superintendent and Sisters to Officers, &c.

53. The Superintencent and Sisters will be expected to restrict their communications with officers, non-commissioned officers, orderlies, and patients as far as practicable within the limits of their duties. They will endeavour to combine personal reserve with strict and respectful obedience to officers, and with courtesy and kindness to non-commissioned officers and men.

Certificates to be given only by Superintendent.

54. No certificate or testimonial will be granted to any Sister leaving the service of the Royal Victoria Hospital, except by the Superintendent.

Travelling Claims Abroad.

Clause 24. 1st February, 1870.

At foreign stations, travelling claims for all branches of the Service will be sent direct to the Controller for examination and authorization. It will be his duty, before sanctioning their payment, to see that proper authority is shown for the journey, and that the charges are in accordance with regulation. When authorized by the Controller, regimental claims will be paid by the Regimental Paymaster, and Staff and Department claims by the Control Paymaster, subject in both cases to final audit by the Chief Auditor.

2nd. GENERAL ORDERS.

Destruction of useless Books, &c.

G. O. 79. 1st July, 1869.

Paragraph 1536 of the Queen's Regulations and Orders for the Army is to be corrected in the following manner, viz.:—

Board to be assembled.

1536. This list is to be referred to a Board of three Staff Officers of the district or station [the Head of the Department to which the records belong being a member], who are to report to the General Officer commanding, their opinion as to the particular documents which may be destroyed without any prospect of inconvenience to the service. After a careful consideration of such report, the General Officer is to transmit the same,—accompanied by his own observations,—to the *Secretary of State for War*, in order that the necessary authority may be obtained for the disposal of the condemned records.

Medical (Contagious Diseases).

G. O. 80.

Specific instructions in regard to the repression of contagious disease, being about to be issued by the Director-General, Army Medical Department, Officers commanding will afford every facility to the Medical Officers under their orders in carrying out the instructions in question.

Duties (After Vaccination).

G. O. 87. 1st September, 1869.
(*Specially issued 13th August*, 1869.)

1. In order to avoid the injurious effects which may be induced by drills and musketry practice immediately after vaccination, Commanding Officers will assign lighter duties to soldiers who have recently undergone that operation.

2. Medical Officers are to furnish daily a list of the men whom they recommend for such exemption.

Embarkations (Soldiers' Wives).

G. O. 98. 1st October, 1869.

Considerable expense and inconvenience having been occasioned by soldiers' wives being confined while on board the vessel in which they are embarked; women near their confinement are not in future to be embarked in mail or contract steamers, or other vessels on short voyages, such as to or from the Mediterranean, West Indies, British North America, &c., and the husbands of such women are to be detained with them.

Recruiting (Mode of Chest Measurement).

G. O. 104.

With reference to paragraph 1335 of the "Queen's Regulations and Orders for the Army" regarding chest measurement, it is directed that the recruit is to be measured *with the arms hanging*, instead of "placed straight above his head."

Recruiting (Medical Examination).

G. O. 105.

1. It having been decided that the medical examination of a recruit by the Staff-Surgeon at the head-quarters of a recruiting district shall be regarded as *final*, the present practice of assembling medical boards to review such decision is to be discontinued.

2. On the arrival of a district recruit at the head-quarters of a regiment or depôt battalion, the Surgeon in charge thereof—should he not concur in the opinion of the district Staff-Surgeon—will fill in W. O. Form 584, countersigned by the Principal Medical Officer, should there be one at the station, and the Officer commanding the regiment or depôt battalion will then forward this report to the Adjutant General for decision, stating his opinion whether the recruit be eligible and likely to re-enlist should he be discharged.

This form must contain the fullest information as regards all the medical disqualifications.

3. District recruits passed by civilian medical practitioners (including Militia Medical-Officers) if found unfit by the district Staff Surgeon, will, with the concurrence of the inspecting Field Officer, be discharged without further reference, but the report on W. O. Form 584 will always be sent in duplicate to the Adjutant-General.

4. The inspecting Field Officer, should he consider the recruit eligible and likely to re-enlist, can detain him till the decision of His Royal Highness the Field-Marshal Commanding-in-Chief be given.

5. When a district recruit is passed primarily by a military Medical Officer, and considered unfit by the district Staff-Surgeon, W. O. Form 584 will be sent in duplicate to the Adjutant-General for instructions, as at present.

6. The medical examination by civilian medical practitioners of *direct* recruits is not considered final.

7. When a direct recruit is considered unfit by a regimental Surgeon, he will bring him before the Principal Medical Officer, if possible, and should he concur in the unfitness, report the case to the Adjutant General on W. O. Form 584, in duplicate, for further instructions, through the Commanding Officer.

8. These instructions modify paragraph 1,351 of the "Queen's Regulations and Orders for the Army," bringing all cases of medical disqualifications under section "d" of that paragraph.

Promotion.

G. O. 114. 1st December, 1869.

(*Specially issued 23rd November*, 1869.)

Her Majesty has been pleased to approve of the promotion of Staff-Assistant Surgeon Robert Waters, M.D., to be a Staff Surgeon, in consideration of his highly meritorious service during the recent epidemic of cholera at the Gambia.

Dated 24th November, 1869.

Local Sanitary Committees.

G. O. 121.

Adverting to paragraph 1,004 of the "Queen's Regulations and Orders for the Army," it is pointed out that there is no regulation authorizing travelling expenses to be incurred by Local Sanitary Committees on visiting out-stations.

The Officer Commanding at an out-station, and the Medical Officer in charge, will be held responsible that all sanitary precautions are attended to.

Embarkations—Officers in Uniform (*Quartermaster-General*).

G. O. 10. 1st February, 1870.

All Officers ordered to embark on duty with troops are to report themselves in uniform to the officer superintending the embarkation, and afterwards to the officer commanding the troops on board the ship.

Every officer proceeding in Her Majesty's Indian troop-ships is to report himself in uniform whether detailed for duty or not.

d. DEPARTMENTAL CIRCULARS.

Sanitary—Circular Memorandum (Meteorological Remarks).

11th August, 1869.

The attention of Medical Officers is invited to the Meteorological Table printed in the Annual Sanitary Report (at page 5 of W. O. Form 516, and at page 4 of W. O. Form 517), and it is requested that, where materials exist for filling up the same, Medical Officers will not only record the observations taken, but discuss any relations which may suggest themselves between the meteorological conditions and the health of the troops, noticing particularly any connection that can be traced between certain states of the atmosphere and the prevalence of epidemic disease.

Statistical.

15th March, 1869.

Annual, Quarterly, and Weekly Sick Returns.

The names in the English List of the new Nomenclature should be invariably used.

The cases of primary and secondary syphilis, and other venereal diseases as shown on page 3, should correspond with the numbers on page 1 of the Weekly Returns.

When "bubo" occurs along with hard or soft chancre, the case should appear under primary syphilis: when it occurs in connection with gonorrhœa, it should appear in Class II., Order 10 (No. 589). Inflamed or suppuration glands in the groin, when not connected with venereal disease, should appear under Class II., Order 6 (Nos. 271 or 272), and the glands affected should be stated.

When tumours and cysts are entered in the return, the nature and seat should be specified.

Circular Statistical (Returns of Depôts).

10th February, 1870.

It having been decided that in future the depôts of regiments serving abroad are to be attached to regiments serving at home, instead of being formed into depôt battalions, I have the honour to call your special attention to the following Instructions, relative to the Weekly and Annual Returns which this arrangement will render necessary:—

1. The sickness and mortality of any depôt, which may be attached to a regiment, are to be included in the Weekly Return along with those of the men of that corps, on page 1, and throughout the return, but the strength is to be separately stated, thus—

	Strength.
——— Regiment..	
Depôt of —— ——— Regiment (attached).. ..	
Total..	

2. The Weekly Return is to include the deaths of all men belonging to the depôt, whether present or detached, exclusive only of invalids dying at sea on passage home, or at Netley, or the port of disembarkation.

3. A separate Admission and Discharge Book is to be kept for the depôt, in which all cases of sickness, and the deaths of the men composing it are to be entered; and this book will accompany the depôt should it be removed.

4. In the event of the depôt being removed to another station, or attached to another regiment, the Admission and Discharge Book, Case Book, Medical History Sheets of the men composing the depôt, and a statement showing the average strength, and the number of admissions, deaths, and cases remaining in each week, from 1st January to the date of removal, are to be transferred with it.

5. In regard to Annual Returns of Sick, the above arrangements will not apply, as it is necessary in these documents to show the statistics of the corps separately from those of any depôt which may have been attached to it.

The Surgeon of the regiment will therefore prepare his Annual Return (W. O. Form 298) in the usual way, entirely excluding all reference to the depôt.

The Medical Officer of a regiment to which any depôt is attached on the 31st December in each year, will prepare from the Admission and Discharge Book, and the details received under the instructions on paragraph 4, a complete Annual Return (W. O. Form 298) for the depôt, from 1st January to 31st December, embracing the sickness and morfality (excepting the deaths referred to in paragrsph 2), and accompanied by the usual documents as per list on page 4 of that Form.

6. The arrival of any depôt to join a regimeut is to be at once reported to this office by the Medical Officer of the corps to which it is to be attached, and he will, at the same time, state whether the instructions in paragraph 4 of this Circular have been complied with.

7. To carry ont this arrangement for the current year, 1870, on the breaking-up of the depôt battalions, the Medical Officer of each depôt Battalion will transmit with each depôt the documents described in paragraph 4, and report the removal to this office.

Memorandum, Statistical (Return of Venereal Diseases).

15th February, 1870.

As some discrepancy has been found to exist in the mode of filling up the Return of Venereal Diseases on W.O. Form 825, which is now embodied on page 12 in the revised Annual Return of Sick, W.O. Form 298, the following instructions are issued with a view to obtain uniformity.

The column of Admissions ought to show the number of *cases*, without reference to the number of *men* in whom they occurred, but the last three columns ought to show the number of *men* who were admitted.

If 29 men were admitted once, 7 twice, and 2 three times, the number of cases admitted would be 49, while the three last columns would show respectively, 29, 7, 2, making a total of 38 men and 49 cases. It must therefore be obvious that if any of the men have been admitted oftener than once, the sum of the last three columns ought not to agree with the number shown in the second column as *cases* admitted.

APPENDIX No. XXVI.

ABSTRACT No. 1, showing the Admissions into Hospital, Deaths, and Invaliding among the Troops in the United Kingdom in 1868.

Strength	Household Cavalry. 1,212			Cavalry. 8,281			Royal Artillery. 9,565			Military Train. 1,509			Foot Guards. 5,678			Infantry Regiments. 25,208			Roy. Art. Depôt Brigade. 2,711			Depôt Battalions. 14,186.		
Diseases.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.
I. *Zymotic Diseases.*																								
1 Miasmatic:																								
Variola	1	..	..	2	..	..	13	..	..	6	..	..	1	..	..	2	..	..	7	..	..	33	2	..
Varioloides	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	4	..	..
Varicella	..	..	..	..	..	..	3	..	..	..	..	..	1	..	..	2	..	..	1	..	..	2	..	..
Morbilli	3	..	..	7	..	..	8	..	..	..	..	..	5	..	..	41	..	..	1	..	..	53	..	..
Scarlatina	2	1	..	13	..	..	10	..	..	2	1	..	3	..	..	20	1	..	11	..	..	9	..	..
Diphtheria	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..
Tonsillitis	30	..	..	205	..	..	356	1	..	51	..	..	179	..	..	724	1	..	163	..	..	567	..	..
Influenza	..	..	..	168	..	..	123	..	..	52	..	..	88	..	..	394	..	..	101	..	..	77	..	..
Coryza	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11	..	..	..	..	..	..	..	..
Ophthalmia	7	..	..	78	..	1	115	..	1	15	..	1	45	..	1	500	..	10	32	..	1	223	..	5
Erysipelas	4	..	..	15	..	..	20	..	..	2	..	..	9	..	..	53	..	..	4	..	..	52	..	..
Furunculus	30	..	..	123	..	..	99	..	..	17	..	..	31	..	..	128	..	..	20	..	..	101	..	..
Anthrax	1	..	..	9	..	..	13	..	..	1	..	..	1	..	..	22	..	..	1	..	..	4	..	..
Pyæmia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	3	..	..
Dysenteria Acuta	..	..	..	2	..	..	12	1	..	..	..	..	1	..	..	18	..	..	4	..	..	14	..	..
" Chronica	..	..	..	4	..	4	17	1	2	2	..	..	..	..	..	6	..	1	11	..	1	26	2	1
Diarrhœa	20	..	..	81	..	1	194	1	..	15	..	..	88	..	..	339	..	2	45	..	..	235	1	2
Cholera Biliosa	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	3	..	..	..	..	..	1	..	..
" Spasmodica	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..
Febris Intermittens	3	..	..	35	..	..	88	..	1	..	..	..	..	..	..	135	..	..	66	..	..	255	..	1

Febris Remittens	.. ..	..	..	..	..	2	..	..	9	..	..	1	..	..	..	..	..	8	..	..	1	..	..	6	..	..
„ Typhoides	.. ..	..	..	..	..	3	..	..	4	1	..	1	1	..	6	..	..	9	5	..	..	..	..	1	1	..
„ Typhus	.. ..	..	..	..	..	16	5	..	2	..	..	..	..	..	..	..	..	5	3	..	2	..	..	2	1	..
„ Continua	.. ..	..	5	..	..	64	5	..	120	..	..	17	..	..	129	3	..	484	6	..	26	..	..	221	6	..
Rheumatismus Acutus	.. ..	..	59	..	..	157	..	..	258	..	..	48	..	..	130	..	..	497	2	5	116	1	..	254	1	..
„ Chronicus	..	..	6	..	1	170	..	19	186	..	2	22	..	3	62	1	4	509	..	53	58	..	2	326	..	13
Parotitis	.. .. ..	..	..	..	..	2	..	..	20	..	..	..	..	..	7	..	..	38	..	..	4	..	..	31	..	..
Vaccinia	.. .. ..	..	..	..	..	1	..	..	5	..	..	..	..	..	..	..	..	3	..	..	..	..	..	2	..	..
Pertussis	.. .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
2. Enthetic:																										
Syphilis Primaria	.. ..	..	60	..	..	591	..	..	680	1	..	89	..	..	898	..	..	1832	..	..	216	..	..	1120	..	..
„ Secundaria	.. ..	..	15	..	1	269	1	9	253	3	14	37	..	1	196	..	..	774	..	35	61	..	..	472	1	17
Cachexia Syphiloidea	.. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	4	2	..	..	..	..	..	1	..	..
Iritis Syphilitica	.. ..	..	4	..	..	18	..	..	14	..	..	1	..	..	11	..	1	35	..	1	1	..	..	15	..	1
Bubo	.. .. ..	..	23	..	..	173	..	..	144	..	..	25	..	..	121	..	..	464	..	1	28	..	..	305	..	..
Gonorrhœa	.. .. ..	..	55	..	..	727	..	..	1112	..	..	158	..	..	396	..	..	2775	..	..	421	..	..	2352	..	..
Phymosis, &c.	.. ..	..	1	..	..	18	..	..	18	..	..	..	..	..	5	..	..	53	..	..	1	..	..	35	..	..
Orchitis (Gonorrhœal)	.. ..	..	9	..	..	59	..	..	46	..	..	7	..	..	73	..	..	147	..	..	19	..	..	126	..	..
Strictura Urethræ	.. ..	..	..	..	..	27	..	1	26	..	..	6	..	..	9	..	2	66	..	6	6	1	1	52	..	..
Verrucæ	.. .. ..	..	1	..	..	24	..	..	35	..	..	14	..	..	27	..	..	63	..	1	8	..	..	51	..	..
Ulcus Penis	.. ..	..	..	..	..	39	..	..	..	..	..	..	..	..	1	..	..	2	..	1	..	..	..	60	..	..
Ophthalmia (Gonorrhœal)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	66	..	..	..	..	..	1	..	..
Rheumatismus (Gonorrhœal)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..
3. Dietic:																										
Scorbutus	.. ..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	4	..	..
Purpura	.. ..	..	1	..	..	3	..	..	2	..	..	..	..	..	5	..	1	2	..	..	..	..	..	5	1	..
Ebriositas	.. ..	..	..	..	..	48	..	..	115	1	..	6	..	..	41	1	..	250	2	1	15	..	..	169	1	..
Bronchocele	.. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..
4. Parasitic:																										
Aphthæ	.. .. ..	..	..	..	..	2	..	..	5	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..
Porrigo	.. .. ..	..	..	..	..	7	..	..	7	..	..	..	..	..	..	..	..	37	..	..	2	..	..	34	..	..
Scabies	.. .. ..	..	6	..	..	165	..	..	191	..	..	19	..	..	114	..	..	769	..	..	73	..	..	665	..	..
Tænia Solium	.. .. ..	..	..	..	..	1	..	..	8	..	..	2	..	..	1	..	..	23	..	..	4	..	..	6	..	..
Dracunculus	.. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..

Abstract No. 1—*continued.*

Diseases.	Household Cavalry.			Cavalry.			Royal Artillery.			Military Train.			Foot Guards.			Infantry Regiments.			Roy. Art. Depôt Brigade.			Depôt Battalions.		
Strength	1,212			8,281			9,565			1,509			5,678			25,208			2,711			14,186		
	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.
Ascaris Lumbricoides	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	2	..	..
Vermes	..	..	..	..	..	..	7	..	..	..	..	..	..	..	..	4	..	..	..	..	..	1	..	..
Phthiriasis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
II. *Constitutional Diseases.*																								
1. Diathetic:																								
Podagra	..	..	..	3	..	..	2	..	..	8	..	1	..	..	..	4	..	..	1	..	..	3	..	..
Lumbago	..	..	..	42	..	..	31	..	..	10	..	..	6	..	..	62	..	1	24	..	..	21	..	..
Ischias	..	..	..	3	..	..	1	..	..	..	..	..	1	..	..	6	..	..	..	..	..	3	..	..
Anæmia	..	..	..	6	..	1	10	..	2	3	..	1	11	..	..	57	..	3	1	..	..	49	..	..
Anasarca	..	..	..	1	..	..	4	..	..	..	..	..	2	..	..	5	..	1	1	..	..	10	..	..
Tumores	..	..	..	4	..	..	4	..	..	2	..	..	3	..	..	13	..	1	2	..	..	4	..	..
Scirrhoma	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	2	2	..
Carcinoma	..	..	..	..	..	..	1	..	..	..	..	..	1	1	..	..	..	..	..	..	..	3	1	..
Lupus	..	..	..	..	..	..	3	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Scirrhus Pylori	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
2. Tubercular:																								
Scrofula	..	..	..	14	..	5	11	..	4	4	..	..	6	..	2	45	1	13	4	..	..	29	1	4
Phthisis Pulmonalis	..	9	5	11	48	10	24	66	33	32	11	1	4	40	7	38	235	50	103	18	9	3	212	67	60
Hæmoptysis	..	2	..	..	14	2	1	25	1	..	1	..	..	13	..	2	48	1	2	8	..	..	32	1	3
Morbus Coxarius	..	..	..	..	..	..	..	..	..	..	1	..	1	1	..	1	1	..	..	1	..	..	..	..	1
Abscessus Psoanus	..	..	1	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	..	..
Tuberculosis	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
,, Mesenterica	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..

III. *Local Diseases.*

1. Nervous System:

| | | |

Abstract No. 1—*continued.*

Diseases.	Household Cavalry.			Cavalry.			Royal Artillery.			Military Train.			Foot Guards.			Infantry Regiments.			Roy. Art. Depôt Brigade.			Depôt Battalions.		
Strength	1,212			8,281			9,565			1,509			5,678			25,208			2,711			14,186		
	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.
2. Circulatory System:																								
Carditis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	..	..	4	..	2
Pericarditis	..	..	..	2	..	..	3	2	..	..	..	..	1	..	..	6	..	..	..	..	..	13	1	1
Hypertrophia Cordis	..	..	..	3	1	3	28	3	4	1	1	..	4	1	2	33	2	16	4	1	..	11	1	5
Atrophia Cordis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Degeneratio „	..	..	..	..	..	..	3	2	..	..	..	..	..	..	..	..	1	..	..	..	..	2	6	1
Morbus Valv: Cordis	..	..	2	21	3	19	40	6	12	3	1	..	12	4	7	81	6	36	1	..	1	96	12	28
Morbus Cordis	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	5	..	1	..	..	..	..	..	..
Palpitatio	..	..	..	1	..	..	3	..	..	4	..	..	..	..	..	29	..	3	3	..	..	28	..	4
Syncope	..	6	..	1	..	..	1	..	..	..	..	..	..	..	..	2	..	..	..	..	..	6	..	..
Aneurisma Aortæ	..	..	..	1	3	..	6	7	1	1	2	..	2	..	2	9	15	..	..	..	..	9	9	..
Aneurisma	..	..	..	7	1	4	10	5	1	1	..	..	2	3	1	14	10	3	..	..	..	4	4	1
Varix	..	..	..	5	..	8	12	..	4	1	..	1	4	..	..	28	..	32	1	..	..	14	..	2
Phlebitis	..	..	..	..	1	..	..	..	1	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..
Angina Pectoris	..	..	..	3	1	1	1	..	1	1	..	..	..	..	1	..	..	..	1	..	..	1	1	..
Arteritis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Atheroma Arteriarum	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
3. Respiratory System:																								
Laryngitis	..	..	..	6	..	..	1	..	..	..	..	..	..	..	..	19	1	..	..	..	..	7	1	..
Œdemlottidis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
Bronchitis Acuta	..	74	..	219	2	..	480	1	..	56	..	..	189	1	..	1015	..	1	135	..	..	509	3	1
„ Chronica	..	2	..	1	56	..	5	110	..	7	22	1	4	42	..	5	332	..	25	46	..	3	262	3	14
Pleuritis	..	..	..	..	15	2	..	33	..	..	6	..	..	18	1	..	101	..	5	5	..	..	55	2	..

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Abstract No. 1—*continued.*

Diseases.	Household Cavalry.			Cavalry.			Royal Artillery.			Military Train.			Foot Guards.			Infantry Regiments.			Roy. Art. Depôt Brigade.			Depôt Battalions.		
Strength	1,212			8,281			9,565			1,509			5,678			25,208			2,711			14,186		
	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.
Ischuria	..	..	..	..	..	..	2	..	..	1	..	..	..	..	..	2	..	..	1	..	..	..	..	..
Hæmaturia	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	4	..	..	1	..	..	5	..	..
Lithiasis	..	..	..	1	..	..	2	..	..	..	..	..	..	..	..	4	..	..	..	..	..	2	..	..
Cystitis	..	..	..	2	..	..	1	..	..	..	..	..	1	..	..	7	1	..	1	..	1	2	..	1
Fistula in Perinco	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	3	..	..	1	..	..	3	..	..
Abscessus Urinalis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	1	..
Enuresis	..	..	..	8	..	..	11	..	2	..	..	..	1	..	..	16	..	2	1	..	..	11	..	1
Diuresis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	..	..	2	..	1
Dysuria	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Morbus Prostaticus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	1	..	..	1	..	..
Diabetes	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	1	..
Albuminuria	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Hæmatocele	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
6. Reproductive System:																								
Varicocele	..	..	..	1	..	..	5	..	1	1	..	..	3	..	..	8	..	2	1	..	..	2	..	..
Hydrocele	..	..	..	6	..	1	10	..	..	1	..	..	9	..	..	18	..	1	1	..	..	22	..	1
Orchitis (not Gonorrhœal)	..	..	..	106	..	2	111	..	..	19	..	..	37	..	..	240	..	1	17	..	1	146	..	1
Spermatorrhœa	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..
Sarcocele	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	2	..	..	..	1	..	1
7. Locomotive System:																								
Arthritis	..	..	..	1	..	..	3	..	1	3	..	..	4	..	1	15	..	3	..	..	..	11	..	..
Synovitis	..	..	..	10	..	..	21	..	1	2	..	..	3	..	..	51	..	6	5	..	1	15	..	..

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Abstract No. 1—*continued.*

Diseases.	Household Cavalry			Cavalry.			Royal Artillery.			Military Train.			Foot Guards.			Infantry Regiments.			Roy. Art. Depôt Brigade.			Depôt Battalions.		
Strength	1,212			8,281			9,565			1,509			5,678			25,208			2,711			14,186		
	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.	Admitted.	Died.	Invalided.
IV. *Developmental Diseases.*																								
4. Diseases of Nutrition:																								
Atrophia	..	..	..	8	..	4	54	..	11	6	..	..	5	..	1	123	1	19	20	..	4	77	..	8
V. *Violent Deaths or Diseases.*																								
1. Accidental:																								
Ambustio	3	..	..	15	..	..	24	..	..	5	..	..	8	..	..	70	1	1	9	..	..	43	..	..
Explosio	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..
Insolatio	..	..	..	4	..	..	..	..	..	..	..	..	..	..	..	8	1	..	1	..	..	..	..	..
Ictus Fulminis	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Submersio	..	1	..	..	2	..	..	9	..	..	1	..	..	..	..	..	11	..	..	1	..	..	2	..
Fractura	4	..	1	50	1	3	58	4	7	4	1	1	19	..	2	112	1	8	8	..	2	51	2	4
Amputatio	1	..	..	..	..	1	1	..	1	..	..	..	..	..	..	1	..	4	..	..	..	1	..	1
Ruptura Venæ	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
„ Ilei	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..
Contusio	51	..	..	526	..	1	637	..	1	73	..	..	90	..	..	865	1	..	163	..	..	477	..	1
Commotio	..	..	..	4	1	..	3	1	..	..	..	..	4	..	..	7	1	1	..	..	..	..	..	..
Vulnus Sclopetarium	..	..	..	1	..	..	3	..	1	..	..	..	2	..	..	4	1	1	..	..	..	..	..	..
„ Incisum	35	..	..	70	..	2	134	..	2	20	..	..	110	..	..	353	1	..	43	..	..	193	..	3
Luxatura	1	..	..	12	..	..	12	..	1	..	..	..	2	..	..	29	..	1	..	..	..	8	..	..
Subluxatio	14	..	..	167	..	1	192	..	2	22	..	..	85	..	..	519	..	..	46	..	..	269	..	..
Vesiculæ Pedis	..	..	..	10	..	..	26	..	1	5	..	..	6	..	..	113	..	..	18	..	..	87	..	..

Venenatio	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..
Vulnus Aortæ	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Morsus Canis	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
„ Equi	..	..	..	3	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..
„ Ursæ	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
„ Hominis	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	1	..	..	..	..
„ Serpentis..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..
2. In Battle :																													
Vulnus Sclopetarium	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..
3. Homicidal :																													
Vulnus Sclopetarium	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	5	..	..	..	..	..	..	..	..	..	..
4. Suicidal :																													
Vulnus Incisum	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	4	2	3	..	..	..	2	..	..	..	..	..
„ Sclopetarium	..	..	..	..	3	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	..
Venenatio	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	2	1	..	..	1	..	..	..	..	..	..	..
Per Vias Ferreas	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
6. Punitus:	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	5	..	..	..	..	..	..	1	..	..	..	..	..	..
No appreciable disease	1	..	..	1	..	..	6	..	..	..	..	..	1	..	..	10	..	..	1	..	..	..	15	..	..	..	..	..	..
Diseases not specified	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	767	12	24	6337	65	205	8558	117	178	1184	19	23	4170	29	101	20,369	201	590	2667	24	38	13,833	196	312					

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 2, showing the Number of Men belonging to the Regiments serving at Home who were Vaccinated during the Year 1868.

	Results.	In those who bore Marks of previous Small-pox.	In those who bore good Marks of previous Vaccination.	In those who bore doubtful Marks of previous Vaccination.	In those who bore no Marks of previous Vaccination or Small-pox.	Total.
Soldiers, not Recruits.	A perfect vaccine pustule	69	454	142	82	747
	A modified ditto	92	430	74	40	636
	A failure in	105	660	68	48	881
	Total	266	1,544	284	170	2,264
Recruits.	A perfect vaccine pustule	258	3,607	166	402	4,433
	A modified ditto	289	4,576	169	200	5,234
	A failure in	388	4,752	114	262	5,516
	Total	935	12,935	449	864	15,183

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 3, showing the Ages of the Troops serving in the United Kingdom, and the Deaths at each Age, during the Year 1868.

	Under 20.		20 and under 25.		25 and under 30.		30 and under 35.		35 and under 40.		40 and upwards.		Total.	
	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.
Household Cavalry	126	1	371	7	298	2	191	..	111	1	115	1	1,212	12
Cavalry of the Line	1,183	4	2,407	14	2,521	14	1,455	22	488	9	227	2	8,281	65
Royal Artillery	1,235	4	2,197	15	2,590	32	2,489	39	918	24	136	3	9,565	117
Military Train	187	2	443	4	489	7	292	5	85	1	13	..	1,509	19
Foot Guards	1,077	1	1,779	8	1,491	9	936	8	328	3	67	..	5,678	29
Infantry Regiments	3,533	15	5,278	35	8,812	54	5,208	61	2,054	31	323	5	25,208	201
Total	7,341	27	12,475	83	16,201	118	10,571	135	3,984	69	881	11	51,453	443
Depôt Brigade, R.A.	1,156	..	703	5	481	8	238	7	106	2	27	2	2,711	24
Depôt Battalions	4,307	17	3,491	37	2,787	40	1,817	52	1,382	39	402	11	14,186	196
Coast Brigade, R.A.	12	..	31	..	188	2	709	9	651	14	146	5	1,737	30
Total	5,475	17	4,225	42	3,456	50	2,764	68	2,139	55	575	18	18,634	250

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 4, showing the Number of Recruits Inspected, and the Number found unfit for Service in each of the Recruiting Districts during the Year 1868.

Districts.		Primary Inspections.	Secondary Inspections.		Total.
			Had been previously examined by Staff Surgeon or other Army Medical Officer.	Had been previously examined by Private Medical Practitioner.	
London ..	Inspected	4,458	446	1,517	6,421
	Rejected	1,667	27	158	1,852
Liverpool..	Inspected	1,676	263	425	2,364
	Rejected	678	35	87	800
Bristol ..	Inspected	400	31	739	1,170
	Rejected	145	1	107	253
York ..	Inspected	154	434	290	878
	Rejected	16	43	41	100
Glasgow ..	Inspected	1,008	313	143	1,464
	Rejected	505	25	34	564
Dublin ..	Inspected	681	106	98	885
	Rejected	260	9	11	280
Belfast ..	Inspected	492	46	195	733
	Rejected	136	3	22	161
Total	Inspected ..	8,869	1,639	3,407	13,915
	Rejected ..	3,407	143	460	4,010

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 5, showing the Native Country of the Recruits inspected at the Head Quarters of each of the Districts in 1868.

Districts.	England.		Wales.		Scotland.		Ireland.		British Colonies or Foreign Countries.	
	Inspected.	Rejected.	Inspected.	Rejected.	Inspected.	Rejected.	Inspected.	Rejected.	Inspected.	Rejected.
London ..	4,173	1,570	..	..	76	18	180	71	29	8
Liverpool ..	982	400	68	32	96	36	507	199	23	11
Bristol ..	367	133	15	5	1	..	13	7	4	..
York ..	109	11	..	..	12	2	33	3	..	..
Glasgow ..	34	14	..	..	854	423	119	68	1	..
Dublin ..	37	15	..	..	17	3	622	242	5	..
Belfast ..	12	3	..	..	16	5	463	128	1	..
Total ..	5,714	2,146	83	37	1,072	487	1,937	718	63	19

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 6, showing the Ages of Recruits Inspected in 1868.

	Boys under 17.	From 17 to 18.	From 18 to 19.	From 19 to 20.	From 20 to 21.	From 21 to 22.	From 22 to 23.	From 23 to 24.	From 24 to 25.	25 and Upwards.
At Head Quarters of Recruiting Districts	137	606	2,288	1,536	1,223	894	873	657	487	168
At Regiments and Depôts ...	498	1,331	2,136	1,265	903	738	599	493	342	155
By Civil Medical Practitioners ...	42	455	1,616	1,128	809	644	559	449	465	47
Total	677	2,392	6,040	3,929	2,935	2,276	2,031	1,599	1,294	370

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 7, showing the Heights of the Recruits Inspected in 1868.

	Under 5 ft. 3 in	From 5 ft. 3 in. to 5 ft. 4 in.	From 5 ft. 4 in. to 5 ft. 5 in.	From 5 ft. 5 in. to 5 ft. 6 in.	From 5 ft. 6 in. to 5 ft. 7 in.	From 5 ft. 7 in. to 5 ft. 8 in.	From 5 ft. 8 in. to 5 ft. 9 in.	From 5 ft. 9 in. to 5 ft. 10 in.	From 5 ft. 10 in. to 5 ft. 11 in.	From 5 ft. 11 in. to 6 ft.	6 ft. and Upwards.
At Head Quarters of Recruiting Districts ...	147	79	370	1,051	2,281	2,434	1,378	632	340	119	38
At Regiments & Depôts.	419	204	749	1,670	1,800	1,516	1,076	533	236	140	117
By Civil Medical Practitioners	46	3	74	264	1,949	1,722	1,075	606	278	139	58
Total	612	286	1,193	2,985	6,030	5,672	3,529	1,771	854	398	213

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 8, showing the Number of Recruits inspected in 1868, at the Head-Quarters of Recruiting Districts, at the following Weights and Ages.

Ages.	Under 100 lbs.	From 100 lbs. to 110 lbs.	From 110 lbs. to 120 lbs.	From 120 lbs. to 130 lbs.	From 130 lbs. to 140 lbs.	From 140 lbs. to 150 lbs.	From 150 lbs. to 160 lbs.	From 160 lbs. to 170 lbs.	From 170 lbs. and upwards.	Total.
Boys under 17	111	17	7	2	...	...	...	...	...	137
From 17 to 18	5	130	249	146	59	13	3	1	...	606
„ 18 to 19	16	221	574	1,028	326	97	21	5	...	2,288
„ 19 to 20	4	37	240	502	392	278	69	12	2	1,536
„ 20 to 21	...	24	105	347	397	204	105	35	6	1,223
„ 21 to 22	...	5	46	284	243	159	111	43	3	894
„ 22 to 23	...	...	27	245	266	184	100	41	10	873
„ 23 to 24	...	...	28	122	178	173	123	27	6	657
„ 24 to 25	...	...	18	87	156	135	55	28	8	487
Upwards of 25	...	...	16	41	39	46	20	3	3	168
Total	136	434	1,310	2,804	2,056	1,289	607	195	38	8,869

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 9, showing the State of Education of the Recruits examined at the Head Quarters of the Recruiting Districts and at Regiments and Depôts in 1868.

	Well Educated.	Able to Write.	Able to Read only.	Unable to Read.	Total.
Recruiting Districts ..	399	5,350	684	2,436	8,869
Regiments and Depôts	697	5,671	978	1,114	8,460
Total	1,096	11,021	1,662	3,550	17,329

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 10, showing the Admissions into Hospital and Deaths, among the Troops serving in the Mediterranean during the year 1868; and the Disabilities of the Invalids sent to England and of those discharged the service at Netley during the same period.

Stations	Gibraltar.		Malta.		Native Troops. R. Malta Fencibles.		Gibraltar.		Malta.		
Strength	4,631		5,377		593		Invalids.		Invalids.		
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Sent Home.	Discharged at Netley.	Sent Home.	Discharged at Netley.	Discharged at Malta.
I. *Zymotic Diseases.*											
1. Miasmatic Diseases:											
Morbilli	1	..	..	..	2	..	..	..	..	..	..
Scarlatina	..	..	3	..	..	..	..	..	..	..	..
Tonsillitis	144	..	125	..	17	..	..	..	..	..	..
Influenza	2	..	17	..	..	..	..	..	..	..	..
Ophthalmia	159	..	154	..	86	..	5	1	1	..	1
Erysipelas	16	..	5	..	..	..	1	..	..	..	..
Furunculus	5	..	46	..	2	..	..	..	..	..	..
Anthrax	2	..	5	..	..	..	..	..	..	..	..
Pyæmia	..	..	..	1	..	..	..	..	..	..	..
Dysenteria Acuta	3	..	71	3	..	..	..	..	..	..	..
„ Chronica	3	..	1	..	..	..	3	..	..	..	..
Diarrhœa	67	..	381	..	18	..	..	1	1	..	..
Cholera Biliosa	1	1	..	..	..	..	..	..	..	..	..
Febris Intermittens	9	..	24	..	4	..	..	..	..	..	..
„ Remittens	6	..	..	..	..	..	..	..	..	..	..
„ Typhoides	17	2	42	22	..	..	..	..	1	..	..
„ Continua	285	2	1064	12	27	2	1	..	7	..	..
Rheumatismus Acutus	111	..	105	..	30	..	..	..	..	..	..
„ Chronicus	142	..	135	..	6	..	11	3	10	2	22
Parotitis	2	..	..	..	..	..	..	..	..	..	..
2. Enthetic Diseases:											
Syphilis Primaria	361	..	100	..	8	..	..	..	..	..	..
„ Secundaria	100	1	53	..	..	..	3	1	1	..	..
Iritis Syphilitica	4	..	4	..	1	..	..	..	..	..	1
Bubo	132	..	13	..	..	..	..	..	..	..	..
Gonorrhœa	373	..	164	..	35	..	..	..	..	..	..
Phymosis, &c.	1	..	7	..	..	..	..	..	..	..	..
Orchitis (Gonorrhœal)	24	..	18	..	1	..	..	..	..	..	..
Strictura Urethræ	13	..	7	..	..	..	..	..	..	..	..
Verrucæ	33	..	12	..	..	..	..	..	..	..	..
3. Dietic Diseases:											
Scorbutus	1	..	3	..	..	..	..	..	..	..	..
Purpura	1	..	..	..	..	..	..	..	..	..	..
Ebriositas	101	..	129	2	1	..	..	..	..	..	..
4. Parasitic Diseases:											
Porrigo	9	..	10	..	..	..	..	..	..	..	..
Scabies	20	..	22	..	1	..	..	..	..	..	..
Tænia Solium	1	..	13	..	..	..	..	..	..	..	..

Abstract No. 10—*continued.*

Stations	Gibraltar.		Malta.		Native Troops. R. Malta Fencibles.		Gibraltar.		Malta.		
Strength	4,631		5,377		593		Invalids.		Invalids.		
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Sent Home.	Discharged at Netley.	Sent Home.	Discharged at Netley.	Discharged at Malta.
II. *Constitutional Diseases.*											
1. Diathetic Diseases:											
Ischias	..	..	1	..	..	..	..	..	..	..	..
Lumbago	12	..	12	..	..	..	..	..	..	..	..
Anæmia	8	..	5	..	..	..	..	1	1	..	..
Anasarca	..	..	4	1	..	..	..	..	..	..	..
Tumores	2	..	2	..	..	..	..	..	..	..	..
Lupus	1	..	..	..	..	..	..	..	..	..	..
Carcinoma	..	..	1	1	..	..	..	..	..	..	..
2. Tubercular Diseases:											
Scrofula	10	..	7	..	..	..	1	1	1	1	..
Phthisis Pulmonalis	44	4	36	9	5	1	25	25	19	22	2
Hæmoptysis	9	..	18	1	..	..	..	..	1	..	..
III. *Local Diseases.*											
1. Of the Nervous System:											
Encephalitis	..	..	..	..	1	1	..	..	..	..	..
Myelitis	..	..	1	..	..	..	..	..	..	..	..
Meningitis	2	2	..	..	..	..	..	..	..	..	..
Apoplexia	2	3	4	2	..	..	..	..	..	..	..
Paralysis	7	..	13	1	..	..	3	3	2	3	..
Delirium Tremens	19	1	19	1	2	..	..	..	..	..	..
Mania	8	..	..	..	1	..	2	..	..	..	..
Amentia	7	..	10	..	7	..	3	..	7	..	2
Hypochondriasis	..	..	1	..	..	..	..	..	..	..	..
Epilepsia	11	..	7	..	2	..	2	1	2	4	2
Tetanus	1	..	1	1	..	..	..	..	..	..	..
Convulsio	..	..	..	..	9	..	..	..	..	..	..
Cephalæa	8	..	12	..	1	..	..	..	1	2	..
Neuralgia	5	..	1	..	..	..	..	..	..	..	..
Dysecœa	2	..	1	..	..	..	..	..	..	3	..
Otitis	19	..	5	..	2	..	..	..	..	..	..
Psellismus	..	..	1	..	..	..	..	..	1	1	..
Cæcitas	..	..	..	..	..	..	..	1	..	..	..
Amaurosis	..	..	1	..	2	..	..	..	..	..	1
Myopia	1	..	..	..	..	..	..	..	..	..	..
Hordeolum	..	..	4	..	..	..	..	..	..	..	..
2. Of the Circulatory System:											
Carditis	..	..	1	..	..	..	..	..	..	..	..
Hypertrophia Cordis	4	..	20	..	..	..	2	..	8	3	..
Atrophia Cordis	..	..	1	..	..	..	..	..	..	..	..
Degeneratio Cordis	..	..	1	2	..	..	..	..	..	..	..
Morbus Valv: Cordis	11	1	24	3	..	1	9	9	4	13	1
Palpitatio Cordis	..	..	4	..	..	..	..	..	..	..	..
Aneurisma Aortæ	..	1	5	3	..	..	..	..	1	..	..
Aneurisma	3	3	..	..	..	..	..	..	..	..	..
Varix	4	..	5	..	..	..	2	1	..	1	..

Abstract No. 10—*continued.*

Stations	Gibraltar.		Malta.		Native Troops. R. Malta Fencibles.		Gibraltar.		Malta.		
Strength	631		5,377		593		Invalids.		Invalids.		
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Sent Home.	Discharged at Netley.	Sent Home.	Discharged at Netley.	Discharged at Malta.
3. Of the Respiratory System:											
Laryngitis	..	..	..	..	..	..	..	..	..	1	..
Bronchitis Acuta	92	..	115	1	37	..	..	..	1	..	..
„ Chronica	46	..	48	..	3	..	4	..	10	..	..
Pleuritis	7	1	18	..	..	..	..	..	1	..	..
Pneumonia	16	2	25	4	3	..	1	..	..	1	..
Apoplexia Pulmonalis	..	..	1	..	..	..	..	..	..	..	..
Asthma	3	..	2	1	..	..	..	..	1	..	..
Epistaxis	..	..	3	..	..	..	..	..	..	..	..
4. Of the Digestive System:											
Stomatitis	..	..	2	..	..	..	..	..	..	..	..
Glossitis	..	..	1	..	..	..	..	..	..	..	..
Gastritis	..	..	..	..	2	..	..	..	..	..	1
Enteritis	1	..	1	1	3	1	..	..	..	..	..
Peritonitis	..	1	1	..	..	..	..	..	..	..	..
Obstipatio	3	..	15	..	..	..	..	..	..	..	..
Dyspepsia	153	..	117	..	38	..	1	..	1	..	..
Colica	10	..	10	..	..	..	..	..	..	..	..
Hæmatemesis	..	..	1	..	..	..	..	..	..	..	..
Hernia	7	..	14	..	..	..	3	4	9	8	9
Hæmorrhois	16	..	20	..	..	..	..	..	..	..	..
Fistula in ano	1	..	2	..	..	..	..	..	..	..	..
Prolapsus ani	1	..	..	..	..	..	..	..	..	..	..
Splenitis	1	..	3	..	1	..	..	..	..	..	..
Hepatitis Acuta	4	..	17	3	..	..	2	..	1	..	..
„ Chronica	18	2	16	2	..	..	5	2	4	6	..
Icterus	41	..	43	1	..	..	..	..	..	..	..
Ascites	1	..	2	1	1	1	..	..	..	..	..
5. Of the Urinary System:											
Nephritis	1	..	4	..	..	..	..	..	2	..	..
Nephria	..	..	1	..	..	..	..	..	..	1	..
Hæmaturia	2	1	2	..	..	..	..	..	1	..	..
Cystitis	..	..	..	..	3	..	..	..	..	..	1
Enuresis	4	..	4	..	..	..	1	..	..	..	..
Dysuria	1	..	..	..	..	..	..	..	..	..	..
Diuresis	..	..	1	..	..	..	..	..	..	..	..
Morbus Addisonii	..	..	..	..	..	..	..	1	..	..	..
6. Of the Reproductive System:											
Varicocele	..	..	1	..	..	..	..	..	..	..	..
Hydrocele	1	..	5	..	1	..	..	..	..	..	..
Orchitis (not Gonorrhœal)	87	..	55	..	3	..	1	1	..	..	1
Hydro-Sarcocele	1	..	..	..	..	..	..	..	..	..	..
Sarcocele	2	..	..	..	..	..	..	..	..	..	..

Abstract No. 10—*continued.*

Stations	Gibraltar.		Malta.		Native Troops. R. Malta Fencibles.		Gibraltar.		Malta.		
Strength	4,631		5,377		593		Invalids.		Invalids.		
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Sent Home.	Discharged at Netley.	Sent Home.	Discharged at Netley.	Discharged at Malta.
7. Of the Locomotive System:											
Arthritis	2	..	2	..	..	..	..	..	..	..	..
Synovitis	6	..	6	..	..	..	1	..	..	..	..
Contractura	1	..	..	..	..	..	1	..	..	3	..
Periostitis	2	..	1	..	..	..	..	..	1	..	..
Exostosis	..	..	1	..	..	..	..	..	..	..	..
Caries	1	..	1	..	..	..	..	..	..	..	..
Necrosis	2	..	4	..	..	..	..	..	2	..	..
Atrophia Musculorum	..	..	..	..	..	..	..	1	..	..	..
8. Of the Integumentary System:											
Urticaria	..	..	5	..	..	..	..	..	..	..	..
Eczema	21	..	39	..	..	..	..	..	..	..	..
Herpes	2	..	7	..	..	..	..	..	..	..	..
Impetigo	..	..	4	..	..	..	..	..	..	..	..
Psoriasis	7	..	7	..	7	..	..	..	..	..	..
Lichen	1	..	..	..	..	..	..	..	..	..	..
Mentagra	..	..	1	..	..	..	..	..	..	..	..
Polypus	2	..	..	..	..	..	..	..	..	..	..
Pemphigus	..	..	1	..	..	..	..	..	..	..	..
Rupia	..	..	1	..	..	..	..	..	..	..	..
Pityriasis	1	..	2	..	..	..	..	..	..	..	..
Roseola	1	..	..	..	..	..	..	..	..	..	..
Acne	1	..	2	..	..	..	..	..	..	..	..
Lepra	1	..	4	..	..	..	..	..	..	..	..
Phlegmon	150	..	276	..	..	..	..	..	1	..	..
Abscessus	72	..	94	..	55	..	2	..	1	..	..
Paronychia	12	..	44	..	..	..	..	..	1	..	..
Ulcus	202	..	138	..	24	..	2	..	2	1	..
IV. *Developmental Diseases.*											
1. Atrophia	26	..	16	..	..	..	11	4	5	8	5
V. *Violent Deaths or Diseases.*											
1. Accidental:											
Ambustio	5	..	5	..	..	..	..	..	..	..	..
Explosio	..	..	1	6	..	..	..	..	..	..	..
Insolatio	1	..	1	1	..	..	..	..	..	..	..
Submersio	..	1	1	2	..	..	..	..	..	..	..
Fractura	13	1	21	4	1	..	..	..	2	..	..
Contusio	164	..	168	..	17	..	..	..	..	..	..
Commotio	..	1	2	..	..	..	..	..	..	..	..
Vulnus Incisum	71	..	117	..	14	..	..	..	..	..	..
Luxatura	1	..	4	..	..	..	..	..	1	2	..
Subluxatio	101	..	93	1	1	..	..	..	..	..	..
Vesiculæ Pedis	2	..	10	..	..	..	..	..	..	..	..

Abstract No. 10—*continued.*

Stations	Gibraltar.		Malta.		Native Troops. R. Malta Fencibles.		Gibraltar.		Malta.		
Strength	4,631		5,377		593		Invalids.		Invalids.		
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Sent Home.	Discharged at Netley.	Sent Home.	Discharged at Netley.	Discharged at Malta.
4. Suicidal:											
Fractura	..	1	..	..	..	..	..	..	..	..	..
Vulnus Incisum	1	..	1	2	..	..	..	..	..	..	..
Venenatio	1	1	..	..	..	..	..	..	..	..	..
Vulnus Sclopetarium ..	..	1	..	1	..	..	..	..	..	..	..
6. Punitus	3	..	..	..	..	..	..	..	..	..	..
No appreciable disease ..	1	..	6	..	..	..	..	..	..	..	..
Total	3,746	34	4,597	96	485	7	108	61	116	86	49

CAUSES of the Deaths among the Invalids.

	From Gibraltar.	From Malta.
Strictura Urethræ	..	1
Scirrhoma	1	..
Phthisis Pulmonalis	3	4
Morbus Valv. Cordis	1	..
Hepatitis Chronica	..	1
Total	5	6

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 11, showing the Ages of the Troops serving in the Mediterranean, and the Deaths at each Age, during the Year 1863.

Corps.	Under 20 Years.		20 and under 25.		25 and under 30.		30 and under 35.		35 and under 40.		40 and upwards.		Total	
	Strength on 1st January.	Died.	Strength on 1st January.	Died.	Strength on 1st January.	Died.	Strength on 1st January.	Died.	Strength on 1st January.	Died.	Strength on 1st January.	Died.	Strength on 1st January.	Died.
Royal Artillery	181	1	329	8	472	9	347	5	140	5	41	1	1,510	29
Royal Engineers	22	..	41	..	197	1	164	1	30	2	11	..	465	4
1st Battalion 13th Foot	107	1	261	..	188	2	139	2	42	1	1	..	738	6
1st „ 24th „	187	1	254	8	151	6	90	2	48	2	4	1	734	20
64th Foot	126	3	205	4	278	6	62	1	63	2	3	1	736	18
Total	623	6	1,090	20	1,286	24	802	11	323	13	59	3	4,183	77

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 12, showing the Admissions into Hospital and Deaths among the Troops serving in British America in the Year 1868.

Stations	Canada.		Nova Scotia.		Newfoundland.		Bermuda	
Average Annual Strength	9,582		3,519		300		1,649	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
1. *Zymotic Diseases.*								
1. Miasmatic Diseases:								
Variola	24	1	..	..	..	..	..	..
Varioloides	14	..	..	..	..	..	..	..
Varicella	1	..	..	..	..	..	..	..
Morbilli	4	..	1	..	..	..	1	..
Scarlatina	20	1	..	..	..	..	..	..
Tonsillitis	323	1	72	..	3	..	11	..
Influenza	14	..	6	..	..	..	10	..
Coryza	1	..	1	..	..	..	..	..
Ophthalmia	160	..	67	..	..	..	48	..
Erysipelas	67	1	10	..	..	..	2	..
Furunculus	26	..	3	..	1	..	1	..
Anthrax	7	..	2	..	..	..	..	..
Pyæmia	1	1	..	..	..	..	..	..
Dysenteria Acuta	8	..	1	..	..	..	81	3
„ Chronica	2	..	4	..	..	..	..	..
Diarrhœa	138	..	26	..	4	..	129	..
Cholera Biliosa	4	..	..	..	..	..	..	..
Febris Intermittens	109	..	3	..	..	..	1	..
„ Remittens	14	..	1	..	..	..	2	..
„ Typhoides	5	4	1	1	..	..	81	11
„ Typhus	1	..	1	..	..	..	..	..
„ Continua	151	1	40	..	..	..	101	4
Rheumatismus Acutus	231	..	48	..	1	..	20	..
„ Chronicus	101	..	27	..	1	..	20	..
Parotitis	7	..	8	..	..	..	1	..
2. Enthetic Diseases:								
Syphilis Primaria	720	..	99	..	1	..	19	..
„ Secundaria	254	..	58	..	3	..	9	..
Cachexia Syphilitica	1	..	..	..	..	..	..	..
Iritis „	9	..	3	..	..	..	1	..
Bubo	186	..	33	..	..	..	12	..
Gonorrhœa	594	..	209	..	10	..	42	..
Phymosis, &c.	20	..	..	..	..	..	..	..
Orchitis (Gonorrhœal)	33	..	13	..	..	..	4	..
Strictura Urethræ	18	..	9	..	..	..	2	..
Verrucæ	10	..	5	..	..	..	4	..
Ulcus Penis	..	..	2	..	1	..	..	..
3. Dietic Diseases:								
Scorbutus	..	..	..	..	..	..	2	..
Purpura	..	..	..	..	..	..	2	..
Ebriositas	140	..	40	..	17	1	44	..

Abstract No. 12—*continued.*

Stations	Canada.		Nova Scotia.		Newfoundland.		Bermuda.	
Average Annual Strength	9,582		3,519		300		1,649	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
4. Parasitic Diseases:								
Porrigo	9	..	1	..	..	..	1	..
Scabies	78	..	23	..	1	..	1	..
Tænia Solium	7	..	2	..	..	..	..	..
Ascaris Lumbricoides	1	..	..	..	..	..	..	..
II. *Constitutional Diseases.*								
1. Diathetic Diseases:								
Podagra	4	..	1	..	..	..	..	..
Lumbago	15	..	3	..	..	..	3	..
Ischias	2	..	1	..	..	..	..	..
Anæmia	2	..	1	..	..	..	..	..
Anasarca	3	..	..	..	..	..	3	..
Tumores	3	..	4	..	..	..	1	..
2. Tubercular Diseases:								
Scrofula	15	..	2	..	..	..	3	..
Phthisis Pulmonalis	60	17	21	..	2	1	9	..
Hæmoptysis	20	..	2	..	..	..	2	..
Tuberculosis	..	..	2	..	..	..	..	..
III. *Local Diseases.*								
1. Nervous System:								
Encephalitis	8	..	..	1	..	..	..	..
Meningitis	2	3	..	1	..	..	1	..
Myelitis	2	1	..	..	..	..	..	..
Apoplexia	..	..	..	1	..	..	..	1
Paralysis	16	..	3	1	..	..	1	..
Delirium Tremens	31	5	9	3	8	2	21	3
Mania	5	1	2	..	..	..	..	..
Amentia	10	..	6	..	1	..	1	..
Convulsio	1	..	..	..	..	..	..	..
Epilepsia	13	..	10	..	..	..	2	..
Cephalæa	32	..	2	..	1	..	12	..
Vertigo	..	..	1	..	..	..	..	..
Neuralgia	17	..	6	..	..	..	2	..
Dysecœa	2	..	1	..	..	..	..	..
Otitis	25	1	4	..	..	..	3	..
Sclerotitis	..	..	1	..	..	..	1	..
Amblyopia	2	..	1	..	..	..	..	..
Myopia	..	..	1	..	..	..	..	..
Odontalgia	..	..	1	..	..	..	..	..
Fistula Lachrymalis	1	..	..	..	..	..	..	..
2. Circulatory:								
Carditis	1	..	..	..	..	..	..	..
Pericarditis	1	..	2	1	..	..	..	..
Hypertrophia Cordis	4	..	2	..	..	..	..	..
Dilatatio Cordis	..	1	..	..	..	..	..	..

Abstract No. 12—*continued.*

Stations	Canada.		Nova Scotia.		Newfoundland.		Bermuda.	
Average Annual Strength	9,582		3,519		300		1,649	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Morbus Valv: Cordis	28	5	8	..	..	..	6	..
Aneurisma Aortæ	8	4	1	..	..	..	1	..
Aneurisma	2	4	1	..	..	..	2	2
Atheroma Aortæ	2	1	..	..	..	..	..	..
Varix	2	..	..	..	..	..	..	..
Syncope	..	..	..	..	..	..	1	..
Palpitatio	1	..	..	..	..	..	..	..
Phlebitis	1	..	..	..	..	..	..	..
3. Respiratory:								
Laryngitis	9	3	1	..	1	..	..	..
Bronchitis Acuta	361	1	123	2	16	..	35	..
,, Chronica	179	1	21	..	4	..	10	..
Pleuritis	29	..	15	..	2	..	5	..
Pleurodynia	..	..	..	..	..	..	3	..
Hydrothorax	1	1	..	..	..	..	..	..
Pneumonia	128	13	40	10	..	..	6	..
Apoplexia Pulmonalis	..	..	..	..	..	..	..	1
Asthma	3	..	3	..	..	..	1	..
Epistaxis	2	..	..	..	..	..	..	..
4. Digestive;								
Glossitis	1	..	..	..	..	..	..	..
Gastritis	1	..	..	..	..	..	..	..
Enteritis	1	..	1	1	..	..	1	1
Peritonitis	1	1	..	..	..	..	1	..
Obstipatio	10	..	2	..	..	..	1	..
Dyspepsia	116	..	25	..	3	..	31	..
Colica	29	..	3	..	..	..	16	..
Hæmatemesis	..	..	..	..	1	..	..	..
Melæna	4	1	..	..	..	..	..	..
Hernia	3	..	5	..	..	..	3	..
Hæmorrhois	47	..	9	..	..	..	8	..
Fistula in Ano	9	..	1	..	..	..	..	..
Hepatitis Acuta	5	..	2	..	..	..	2	..
,, Chronica	7	..	9	1	1	..	4	..
Icterus	15	..	3	..	..	..	2	..
5. Urinary:								
Nephritis	5	1	1	..	..	..	2	1
Nephria	2	..	2	..	..	..	..	..
Ischuria	1	..	..	..	..	..	..	..
Hæmaturia	7	..	2	..	..	..	..	..
Lithiasis	..	..	..	..	..	..	1	..
Calculus Renalis	1	..	..	..	..	..	..	..
,, Vesicæ	1	..	..	..	..	..	..	..
Cystitis	1	..	..	..	..	..	1	..
Fistula in Perineo	1	..	..	..	..	..	..	..
Enuresis	4	..	1	..	..	..	1	..
Diuresis	..	..	1	..	..	..	..	..
Diabetes	..	..	1	..	..	..	..	..

Abstract No. 12—*continued.*

Stations	Canada.		Nova Scotia.		Newfoundland.		Bermuda.	
Average Annual Strength	9,582		3,519		300		1,649	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
6. Reproductive:								
Hydrocele	2	..	..	..	..	..	..	..
Orchitis (not Gonorrhœal)	67	..	21	..	..	..	13	..
7. Locomotive:								
Arthritis	3	..	4	..	..	..	..	..
Synovitis	10	..	10	..	1	..	1	..
Contractura	3	..	..	..	..	..	3	..
Periostitis	7	..	..	..	..	..	..	..
Exostosis	2	..	..	..	..	..	..	..
Caries	1	..	..	..	..	..	..	..
Necrosis	2	..	..	..	..	..	1	..
8. Integumentary:								
Urticaria	3	..	1	..	..	..	..	..
Eczema	49	..	12	..	1	..	4	..
Herpes	42	..	5	..	1	..	..	..
Impetigo	4	..	1	..	..	..	4	..
Psoriasis	8	..	3	..	..	..	1	..
Lichen	1	..	..	..	1	..	..	..
Mentagra	..	..	1	..	..	..	..	..
Tinea Capitis	1	..	1	..	..	..	3	..
Pernio	..	..	..	..	1	..	..	..
Ecthyma	1	..	..	..	..	..	1	..
Lepra	2	..	..	..	..	..	..	..
Pityriasis	1	..	..	..	..	..	..	..
Prurigo	2	..	..	..	..	..	..	..
Rupia	2	..	..	..	..	..	..	..
Acne	2	..	..	..	..	..	..	..
Phlegmon	320	..	66	..	1	..	63	..
Abscessus	224	1	47	..	..	..	21	..
Paronychia	27	..	10	..	..	..	6	..
Ulcus	360	..	42	..	10	..	71	..
IV. *Developmental Diseases.*								
4. Diseases of Nutrition:								
Atrophia	43	..	6	..	2	..	14	..
V. *Violent Deaths or Diseases.*								
1. Accidental:								
Ambustio	51	..	18	..	..	..	6	..
Explosio	..	..	..	2	..	..	..	2
Gelatio	23	..	7	..	..	..	..	..
Insolatio	7	3	..	..	..	..	1	..
Submersio	..	5	..	1	..	..	1	4
Fractura	51	1	12	..	2	1	13	1
Amputatio	1	..	2	..	..	..	..	..
Per Vias Ferreas	..	1	..	..	..	..	..	..
Contusio	365	..	82	..	6	..	59	..

Abstract No. 12—*continued.*

Stations	Canada.		Nova Scotia.		Newfoundland.		Bermuda.	
Average Annual Strength	9,582		3,519		390		1,649	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Commotio	1	..	..	..	..	..	..	..
Vulnus Sclopetarium	5	..	2	..	..	..	1	..
„ Incisum	130	..	48	..	..	..	32	..
Luxatura	17	1	2	..	..	..	..	..
Subluxatio	216	..	62	..	6	..	41	..
Vesiculæ Pedis	24	..	5	..	..	..	1	..
Venenatio	1	..	..	..	..	..	..	..
Morsus Hominis	4	..	3	..	..	..	..	..
„ Canis	1	..	..	..	..	..	..	..
„ Felis	2	..	..	..	..	..	..	..
„ Bubonis	1	..	..	..	..	..	..	..
3. Homicidal								
Vulnus Sclopetarium	1	1	..	..	..	..	..	..
Fractura	..	..	..	1	..	..	..	..
4. Suicidal:								
Vulnus Sclopetarium	2	5	..	1	..	..	..	2
„ Incisum	3	..	..	..	..	..	..	..
Venenatio	..	2	..	..	..	..	..	..
Submersio	..	..	..	1	..	..	..	..
6. Punitus	..	..	1	..	..	..	..	..
No appreciable disease	7	..	2	..	..	..	..	..
Total	7,000	95	1,665	29	115	5	1,227	36

Causes of the Deaths of the Invalids.

Diseases.	Canada.	Nova Scotia, &c.	Bermuda.
Phthisis Pulmonalis	3	3	1
Morbus Valv: Cordis	..	1	2
Mania	..	..	1
Ascites	..	..	1
Nephria	1	..	..
Submersio (Suicidal)	..	1	..
Total	4	5	5

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 13, showing the Number of Invalids sent Home from British America and of Men finally discharged the service as Invalids in British America and at the Invalid Depôt in England in the Year 1868.

Diseases.	Canada.	Nova Scotia.	Newfoundland.	Total.	Bermuda.	Discharged the Service in British America.	Discharged at the Invalid Depôt.	
							From British America.	From Bermuda.
I. *Zymotic Diseases.*								
1. Miasmatic:								
Ophthalmia	1	4	..	5	2	1	6	1
Dysenteria	2	1	..	3	..	..	1	..
Rheumatismus ..	12	3	..	15	1	..	3	1
2. Enthetic:								
Syphilis Secundaria ..	6	3	..	9	2	4	3	1
Cachexia Syph: ..	1	..	..	1	..	..	..	..
Bubo	..	1	..	1	..	..	..	..
Gonorrhœa	1	..	..	1	..	..	..	..
Strictura Urethræ ..	..	2	..	2	..	..	..	..
II. *Constitutional Diseases.*								
1. Diathetic:								
Anæmia	2	..	..	2	..	..	..	..
Anasarca	..	..	..	..	..	..	..	..
Tumores	..	1	..	1	..	..	..	..
2. Tubercular:								
Scrofula	3	..	..	3	2	..	3	..
Phthisis Pulmonalis ..	34	10	..	44	10	5	38	7
Hæmoptysis	2	..	..	2	..	..	1	..
III. *Local Diseases.*								
1. Nervous:								
Myelitis	1	..	..	1	..	..	..	..
Encephalitis	1	..	..	1	..	..	..	..
Paralysis	1	1	..	2	..	..	4	..
Mania	4	2	..	6	..	..	..	..
Amentia	4	8	1	13	2	..	..	..
Epilepsia	6	2	..	8	..	..	2	..
Cephalæa.	1	..	..	1	..	..	..	..
Dysecœa	1	..	..	1	1	..	2	1
Fistula Lachrymalis .	1	..	..	1	..	..	..	..
Amblyopia	1	1	..	2	..	..	..	..
Cæcitas	1	..	..	1	..	1	3	..
Staphyloma	1	..	..	1	..	..	..	..
Myopia	..	1	..	1	..	..	..	..
2. Circulatory:								
Carditis	1	..	..	1	..	..	..	..
Hypertrophia Cordis	2	1	..	3	..	..	1	..
Morbus Valv: „	12	5	..	17	5	..	21	2
Angina Pectoris ..	1	..	..	1	..	..	..	..
Aneurisma Aortæ ..	4	..	..	4	..	2	..	..
Aneurisma	..	1	..	1	1	..	6	..
Varix..	1	..	..	1	..	..	2	1
Palpitatio	..	..	..	..	..	..	1	..

Abstract No. 13—*continued.*

Diseases.	Canada.	Nova Scotia.	Newfoundland.	Total.	Bermuda.	Discharged the Service in British America.	Discharged at the Invalid Depôt. From British America.	Discharged at the Invalid Depôt. From Bermuda
3. Respiratory:								
Laryngitis	3	..	..	3	..	..	3	..
Bronchitis Acuta ..	1	4	..	5	..	..	..	..
Bronchitis Chronica..	12	1	..	13	1	3	5	..
Pleuritis	1	..	..	1	..	..	..	..
Pneumonia	2	..	..	2	..	..	6	..
Asthma	..	1	..	1	..	..	..	..
4. Digestive:								
Dyspepsia	1	..	..	1	..	..	2	..
Hernia	7	3	..	10	2	3	9	2
Hæmorrhois	1	..	..	1	1	..	1	..
Fistula in Ano ..	2	..	..	2	..	..	..	..
Hepatitis Chronica ..	..	1	1	2	..	..	..	..
Icterus	1	..	..	1	..	..	..	..
5. Urinary:								
Nephria	1	1	..	2	..	..	1	..
6. Reproductive:								
Orchitis (not Gonor:)	..	1	..	1	..	..	1	..
7. Locomotive:								
Arthritis	..	1	..	1	..	1	1	..
Synovitis	..	..	1	1	..	..	2	..
Contractura	..	..	..	..	3	..	..	1
Periostitis	2	..	..	2	..	..	..	..
Caries	1	..	..	1	..	..	..	..
Deformitas	1	..	..	1	..	..	..	..
Atrophia Musculorum	..	..	..	..	..	..	1	..
8. Integumentary:								
Eczema	2	..	..	2	..	..	..	..
Abscessus	3	1	..	4	..	..	1	..
Ulcus	2	1	..	3	..	1	2	..
IV. *Developmental Diseases.*								
Atrophia	2	3	..	5	4	2	13	4
V. *Violent Deaths or Diseases.*								
1. Accidental:								
Fractura	6	..	..	6	1	2	9	1
Amputatio	..	1	..	1	..	2	..	..
Contusio	..	..	..	..	1	1	..	1
Commotio	1	1	..	2	..	..	..	..
Vulnus Sclopetarium.	1	..	..	1	..	..	2	1
„ Incisum ..	2	..	..	2	..	..	1	..
Subluxatio	2	..	..	2	..	..	1	..
4. Suicidal:								
Vulnus Sclopetarium.	..	..	..	..	1	..	..	..
Total	165	67	3	235	42	28	158	24

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 14, showing the Ages of the Troops serving in British America, and the Deaths at each Age, during the Year 1868.

Station.	Corps.	Under 20.		20 and under 25.		25 and under 30.		30 and under 35.		35 and under 40.		40 and upwards.		Total.	
		Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.
Bermuda	Royal Artillery ..	4	..	5	..	136	3	28	1	3	..	..	..	176	4
	Royal Engineers ..	19	..	63	1	78	1	41	3	38	2	13	..	252	7
	61st Regiment ..	110	2	203	3	169	4	119	1	71	4	53	..	725	14
Canada, Nova Scotia, and Newfoundland.	13th Hussars ..	49	1	104	..	195	3	50	4	30	1	11	2	439	11
	Royal Artillery ..	62	1	392	1	747	11	650	7	254	7	58	3	2,163	30
	Royal Engineers ..	9	..	70	..	110	1	113	1	35	..	9	..	346	2
	1st Bn. 16th Foot	75	..	236	1	232	4	89	1	24	1	1	..	657	7
	1st „ 22nd „	42	..	205	..	285	3	144	3	39	1	8	..	723	7
	29th Foot	58	..	287	3	201	2	89	1	68	..	16	..	719	6
	30th „	45	..	274	1	251	1	113	1	34	..	8	..	725	3
	47th „	165	..	140	1	181	..	107	2	33	..	9	..	635	3
	53rd „	42	..	304	..	212	..	97	2	31	1	1	..	687	3
	1st Bn. 60th Foot..	86	2	229	2	280	4	89	1	25	..	2	1	711	10
	4th „ „ „ ..	26	2	189	..	291	3	155	1	29	..	4	1	694	7
	69th Foot	136	1	264	3	138	3	68	1	18	..	..	..	624	8
	78th „	106	..	306	1	279	3	72	2	13	1	2	..	778	7
	1st Bn. Rifle Brig.	37	..	272	2	252	4	110	5	36	..	..	..	707	11
	Rl. Canadian Rifles	33	..	39	..	105	..	500	4	409	2	159	2	1,245	8
	Total	1,104	9	3,582	19	4,142	50	2,634	41	1,190	20	354	9	13,006	148

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 15, showing the Admissions into Hospital and Deaths among the White Troops serving in the Windward and Leeward Command and Jamaica, in the Year 1868; the disabilities of the Invalids sent home, and of those Discharged the Service at Netley during the same period.

Stations	Windward and Leeward Command.		Subordinate Stations.						Jamaica.		Invalids.			
			Barbadoes.		Trinidad.		St. Vincent.				Sent Home from		Discharged at the Invalid Depôt from	
Strength	806		603		146		57		778					
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	West Indies.	Jamaica.	West Indies.	Jamaica.
I. *Zymotic Diseases.*														
1. Miasmatic:														
Tonsillitis	10	..	9	..	1	..	..	..	5	..	..	..	..	..
Influenza	20	..	14	..	6	..	..	..	..	..	..	..	..	..
Ophthalmia	13	..	9	..	4	..	..	..	6	..	..	..	..	..
Erysipelas	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Furunculus	3	..	2	..	1	..	..	..	1	..	..	..	..	..
Dysenteria Acuta	13	..	13	..	..	..	..	..	2	..	..	..	..	..
„ Chronica	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Diarrhœa	28	..	25	..	3	..	..	..	12	..	..	..	..	..
Febris Intermittens	40	..	10	..	29	..	..	..	3	..	..	..	..	..
„ Remittens	7	..	4	..	1	..	2	..	32	1	..	..	1	..
„ Typhoides	2	1	1	1	1	..	..	..	..	..	..	..	..	..
„ Continua	13	..	13	..	..	..	..	..	12	..	..	..	..	..
„ Icterodes	1	..	1	..	..	..	..	..	..	..	..	..	..	..

Abstract No. 15—*continued.*

Stations	Windward and Leeward Command.		Subordinate Stations.						Jamaica.		Invalids.			
			Barbadoes.		Trinidad.		St. Vincent.				Sent Home from		Discharged at the Invalid Depôt from	
Strength	806		603		146		57		778					
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	West Indies.	Jamaica.	West Indies.	Jamaica.
Rheumatismus Acutus.	5	..	4	..	1	..	..	..	9	..	..	..	..	..
„ Chronicus	12	..	11	..	1	..	..	..	2	..	..	1	1	..
Parotitis	..	..	..	..	..	..	..	..	1	..	..	..	..	..
2. Enthetic:														
Syphilis Primaria	93	..	80	..	9	..	4	..	19	..	..	..	..	..
„ Secundaria	42	..	26	..	15	..	1	..	14	..	2	..	1	..
Iritis Syphilitica	1	..	..	..	1	..	..	..	..	..	..	..	..	..
Bubo	23	..	14	..	2	..	7	..	7	..	..	..	..	..
Gonorrhœa	106	..	95	..	10	..	1	..	41	..	..	..	..	..
Phymosis, &c.	2	..	2	..	..	..	..	..	2	..	..	..	..	..
Strictura Urethræ	1	..	1	..	..	..	..	..	1	..	..	..	..	..
Verrucæ	8	..	8	..	..	..	..	..	..	..	..	..	..	..
3. Dietic:														
Ebriositas	36	..	33	..	3	..	..	..	24	..	..	..	..	..
4. Parasitic:														
Porrigo	4	..	4	..	..	..	..	..	..	..	..	..	..	..
Scabies	1	..	1	..	..	..	..	..	4	..	..	..	..	..
Ascaris Lumbricoides	1	..	1	..	..	..	..	..	..	..	..	..	..	..

| | | |

Abstract No. 15—*continued.*

Stations	Windward and Leeward Command.		Subordinate Stations.						Jamaica.		Invalids.			
			Barbadoes.		Trinidad.		St. Vincent.				Sent Home from		Discharged at the Invalid Depôt from	
Strength	806		603		146		57		788					
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	West Indies.	Jamaica.	West Indies.	Jamaica.
3. Respiratory System:														
Bronchitis Acuta	6	..	6	..	1	..	..	..	13	..	..	..	..	..
„ Chronica	10	..	9	..	..	..	..	..	6	..	..	1	..	..
Pleuritis	2	..	1	..	1	..	..	..	..	..	..	..	..	..
Pneumonia	1	..	1	..	..	..	..	..	..	..	..	..	..	..
Pleurodynia	2	..	2	..	..	..	..	..	..	..	..	..	..	..
4. Digestive System:														
Gastritis	1	..	1	..	..	..	..	..	..	..	..	1	..	..
Peritonitis	..	..	..	..	..	..	..	..	..	1	..	..	..	..
Dyspepsia	13	..	11	..	2	..	..	..	9	..	..	..	..	..
Colica	9	..	9	..	..	..	..	..	3	..	..	..	..	..
Hæmatemesis	1	..	1	..	..	..	..	..	..	..	..	..	..	..
Hernia	5	..	5	..	..	..	..	..	..	..	1	..	1	1
Hæmorrhois	4	..	3	..	1	..	..	..	5	..	..	..	..	..
Prolapsus Ani	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Splenitis	1	..	1	..	..	..	..	..	1	..	..	..	..	..
Hepatitis Acuta	2	1	..	..	2	1	..	..	1	..	..	..	..	..
Chronica	12	..	11	..	1	..	..	..	1	..	1	..	..	..
Icterus	1	..	1	..	..	..	..	..	4	..	..	..	..	..

| | | |

Abstract No. 15—*continued.*

Stations	Windward and Leeward Command.		Subordinate Stations, Barbadoes.		Trinidad.		St. Vincent.		Jamaica.		Invalids. Sent Home from		Discharged at the Invalid Depôt from	
Strength	806		603		146		57		778					
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	West Indies.	Jamaica.	West Indies.	Jamaica.
V. *Violent Deaths or Diseases.*														
1. Accidental:														
Ambustio	1	..	..	..	..	..	1	..	1	..	..	1	..	..
Submersio	..	1	..	1	..	..	..	..	..	..	..	..	..	..
Fractura	3	..	3	..	2	..	3	..	6	..	1	..	2	..
Contusio	47	..	38	..	5	..	4	..	25	..	..	..	..	..
Commotio	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Vulnus Sclopetarium	..	..	..	..	..	..	..	..	..	..	..	1	..	1
„ Incisum	21	..	15	..	3	..	3	..	30	..	1	..	1	..
Luxatura	1	..	1	..	..	..	..	..	2	..	..	..	..	..
Subluxatio	13	..	4	..	9	..	..	..	14	..	..	..	..	..
Vesiculæ Pedis	6	..	2	..	4	..	..	..	1	..	..	..	..	..
Morsus Hominis	1	..	..	..	1	..	..	..	..	..	..	..	..	..
4. Suicidal:														
Vulnus Incisum	1	..	1	..	..	..	..	..	..	..	..	..	..	..
Simulatio Morbi	2	..	2	..	..	..	..	..	..	..	..	..	..	..
Total	892	6	702	4	151	1	37	1	451	3	32	36	19	18

Abstract No. 15—*continued.*

CAUSES of Deaths of the Invalids.

	Jamaica.	Windward and Leeward Command.
Phthisis Pulmonalis	1	1
Morbus Valv : Cordis	2	..
Hepatitis Chronica	..	1
Total	3	2

Appendix No. XXVI—*continued.*

Abstract No. 16, showing the Admissions into Hospital and Deaths among the Black Troops serving in the Windward and Leeward Command, Jamaica, Honduras, and Bahamas, in the Year 1868, and the Disabilities of those Discharged the Service as Invalids during the same period, in the West Indies and Western Africa.

Stations	Windward and Leeward Command.		Subordinate Stations. Barbadoes.		Subordinate Stations. Demerara.		Jamaica.		Honduras.		Bahamas.		Black Troops in West Indies and W. Africa.
Average Strength	575		429		128		878		270		337		2,984
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Discharged as Invalids.
I. Zymotic Diseases.													
1. Miasmatic:													
Variola	..	..	..	..	..	..	1	..	..	..	..	..	..
Varioloides	..	..	..	..	..	..	1	..	..	..	..	..	..
Tonsillitis	5	..	5	..	..	..	6	..	..	..	..	..	..
Influenza	1	..	..	..	1	..	1	..	..	..	1	..	..
Ophthalmia	9	..	6	..	3	..	24	..	6	..	12	..	1
Erysipelas	..	..	..	..	..	..	..	..	1	..	..	..	..
Furunculus	..	..	..	..	..	..	10	..	..	..	1	..	..
Dysenteria Acuta	2	..	2	..	..	..	2	..	5	..	2	..	..
„ Chronica	..	..	..	..	..	..	1	..	1	..	..	..	..
Diarrhœa	8	..	7	..	1	..	6	..	12	..	10	..	2
Cholera Spasmodica	..	..	..	..	..	..	..	..	4	2	..	..	..
Febris Intermittens	30	..	20	..	10	..	2	..	14	..	17	..	..

| | | |

Abstract No. 16—*continued.*

Stations	Windward and Leeward Command.		Subordinate Stations.				Jamaica.		Honduras.		Bahamas.		Black Troops in West Indies and W. Africa.
			Barbadoes.		Demerara.								
Average Strength	575		429		128		878		270		337		2,984
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Discharged as Invalids.
Phthisis Pulmonalis	8	5	7	4	1	1	22	9	3	..	4	3	8
Hæmoptysis	..	..	..	..	..	..	4	..	..	..	..	..	..
Abscessus Psoanus	..	..	..	..	..	..	..	..	..	..	..	1	..
III. *Local Diseases.*													
1. Nervous System:													
Meningitis	1	..	1	..	..	..	..	..	..	..	..	..	..
Mollities Cerebri	2	2	1	1	1	1	..	..	..	..	..	..	..
Apoplexia	..	..	..	..	..	..	1	1	..	..	..	1	..
Paralysis	..	..	..	..	..	..	..	..	2	..	..	..	..
Mania	2	..	1	..	1	..	6	..	..	..	..	..	2
Amentia	1	..	1	..	..	..	1	..	..	..	..	..	2
Epilepsia	1	..	1	..	..	..	9	..	..	..	..	..	..
Cephalæa	4	..	3	..	1	..	8	..	2	..	..	..	..
Neuralgia	..	..	..	..	..	..	2	..	..	..	3	..	..
Dysecœa	..	..	..	..	..	..	2	..	..	..	..	..	..
Otitis	2	..	1	..	..	..	..	..	1	..	..	..	1
Cataractes	2	..	1	..	1	..	..	..	..	..	..	..	..

| | | |

Abstract No. 16—*continued.*

Stations	Windward and Leeward Command.		Subordinate Stations.				Jamaica.		Honduras.		Bahamas.		Black Troops in West Indies and W. Africa.
			Barbadoes.		Demerara.								
Average Strength	575		429		128		878		270		337		2,984
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Discharged as Invalids.
Cystitis	1	..	..	..	1	..	1	..	..	..	..	..	..
Diuresis	..	..	..	..	..	..	1	..	..	..	..	..	..
6. Reproductive System:													
Varicocele	..	..	..	..	..	..	..	..	1	..	..	..	..
Hydrocele	..	..	..	..	..	..	2	..	..	..	1	..	..
Orchitis (not Gonorrhœal)	5	..	2	..	3	..	11	..	3	..	3	..	1
7. Locomotive System:													
Arthritis	..	..	..	..	..	..	..	..	..	..	..	..	2
Synovitis	1	..	..	..	1	..	1	..	..	..	4	..	..
Periostitis	..	..	..	..	..	..	6	..	1	..	..	..	..
Caries	..	..	..	..	..	..	1	..	..	..	1	..	1
8. Integumentary System:													
Eczema	1	..	..	..	..	..	..	..	3	..	..	..	..
Herpes	..	..	..	..	..	..	1	..	..	..	2	..	..
Impetigo	..	..	..	..	..	..	1	..	..	..	..	..	..
Psoriasis	..	..	..	..	..	..	1	..	..	..	..	..	..
Lepra	..	..	..	..	..	..	2	..	..	..	..	..	..

| | | |

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 17, showing the Admissions into Hospital and Deaths among the Black Troops serving in Western Africa, during the Year 1868.

Stations	Sierra Leone.		Gambia.		Gold Coast.		Lagos.	
Strength	438		166		245		75	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
I. *Zymotic Diseases.*								
1. Miasmatic:								
Varioloides.	..	..	1	..	..	..	..	..
Morbilli	..	..	..	..	1	..	..	..
Tonsillitis	4	..	4	..	4	..	..	..
Influenza	1	..	2	..	..	..	2	..
Ophthalmia	9	..	3	..	6	..	2	..
Furunculus	4	..	2	..	6	..	1	..
Dysenteria Acuta	3	1	12	..	13	..	5	1
„ Chronica	2	..	..	..	1	..	..	..
Diarrhœa	4	..	1	..	11	..	12	..
Febris Intermittens	1	..	1	..	..	..	19	1
„ Remittens	68	1	9	..	87	2	2	..
Rheumatismus Acutus	1	..	8	..	10	..	4	..
„ Chronicus ..	58	1	10	..	8	..	5	..
2. Enthetic:								
Syphilis Primaria	36	..	9	..	11	..	11	..
„ Secundaria	15	..	2	..	2	..	7	..
Iritis Syphilitica	3	..	..	..	..	..	..	..
Bubo	22	..	5	..	6	..	5	..
Gonorrhœa	48	..	9	..	23	..	6	..
Phymosis, &c.	1	..	3	..	..	..	..	..
Orchitis (Gonorrhœal)	4	..	2	..	3	..	2	..
Strictura Urethræ	..	..	..	..	2	..	..	..
Verrucæ	1	..	..	..	..	..	..	..
3. Dietic Diseases:—								
Scorbutus	..	..	..	..	1	..	2	..
4. Parasitic:								
Scabies	4	..	..	..	7	..	1	..
Tænia Solium	2	..	..	..	..	..	..	..
Dracunculus	..	..	..	..	..	..	31	..
II. *Constitutional Diseases.*								
1. Diathetic:								
Ischias	..	..	..	..	..	..	1	..
Lumbago	1	..	..	..	1	..	1	..
Anæmia	3	..	..	..	..	..	..	..
Anasarca	1	..	..	..	..	..	..	..
2. Tubercular:								
Scrofula	4	..	1	..	..	..	4	..
Phthisis Pulmonalis	9	7	1	1	1	1	1	..
Hæmoptysis	3	..	1	..	..	..	1	..
III. *Local Diseases.*								
1. Nervous System:								
Encephalitis	..	..	..	1	..	..	..	..
Apoplexia	..	..	..	..	1	1	..	..

Abstract No. 17—*continued.*

Stations	Sierra Leone.		Gambia.		Gold Coast.		Lagos.	
Strength	438		166		245		75	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Lethargus	..	1	..	..	..	..	..	..
Paralysis	..	..	..	..	1	1	..	..
Mania	1	..	..	..	..	..	..	..
Epilepsia	..	..	..	..	1	1	..	..
Cephalæa	1	..	1	..	1	..	1	..
Neuralgia	..	..	1	..	..	..	2	..
Otitis	..	..	..	..	1	..	1	..
2. Circulatory System:								
Hypertrophia Cordis	..	..	3	..	..	..	..	..
Morbus Valv: Cordis	2	..	..	..	..	..	1	..
3. Respiratory System:								
Bronchitis Acuta	11	..	4	..	47	..	2	..
„ Chronica	9	1	5	..	..	..	2	..
Pleuritis	2	..	1	..	2	..	..	..
Pneumonia	4	..	2	2	3	..	..	..
Asthma	1	..	..	..	..	..	..	..
Epistaxis	..	..	..	..	3	..	..	..
4. Digestive System:								
Gastritis	..	..	1	..	..	..	..	..
Obstipatio	..	..	..	..	6	..	..	..
Dyspepsia	2	..	1	..	..	..	..	..
Colica	2	..	..	..	11	..	2	..
Hæmatemesis	..	..	1	..	..	..	..	..
Hernia	1	..	..	..	..	..	..	..
Hæmorrhois	..	..	..	..	1	..	1	..
Splenitis	..	..	..	..	1	..	..	..
Hepatitis Acuta	..	..	1	1	2	..	4	..
„ Chronica	1	..	..	..	..	..	..	..
Ascites	3	2	..	..	..	..	..	..
5. Urinary System:								
Nephritis	..	..	..	..	..	..	1	..
Hæmaturia	1	..	..	..	..	..	1	..
6. Reproductive System:								
Varicocele	..	..	..	..	..	..	1	..
Hydrocele	..	..	..	..	1	..	..	..
Orchitis (not Gonorrhœal)	8	..	1	..	1	..	4	..
7. Locomotive System:								
Arthritis	1	..	1	..	..	..	..	..
Periostitis	1	..	..	..	1	..	..	..
Caries	1	..	..	..	..	..	..	..
8. Integumentary System:								
Impetigo	..	..	..	..	1	..	..	..
Psoriasis	..	..	..	..	1	..	..	..

Abstract No. 17—*continued.*

Stations	Sierra Leone.		Gambia.		Gold Coast.		Lagos.	
Strength	438		166		245		75	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Pemphigus	..	..	..	..	1	..	..	..
Elephantiasis	1	..	..	..	..	..	..	..
Phlegmon	18	..	4	..	7	..	..	..
Abscessus	5	..	3	..	6	..	9	..
Paronychia	6	..	3	..	1	..	1	..
Ulcus	48	..	9	..	18	..	9	..
IV. *Developmental Diseases.*								
Atrophia	..	..	..	..	..	..	2	..
V. *Violent Deaths or Diseases.*								
1. Accidental:								
Ambustio	..	..	..	..	1	..	..	..
Contusio	7	..	1	..	22	..	..	..
Vulnus Sclopetarium	..	..	..	..	1	..	..	..
„ Incisum	12	..	5	..	26	..	1	..
Subluxatio	1	..	1	..	1	..	..	..
Vesiculæ Pedis	2	..	..	..	2	..	..	..
No appreciable disease	1	..	..	..	..	..	..	..
Total	465	14	135	5	407	6	139	2

APPENDIX No. XXIV—*continued.*

ABSTRACT No. 18, showing the Ages of the Troops serving in West Indies and Western Africa, and the Deaths at each Age, during the year 1868.

WHITE TROOPS.	Under 20.		20 and under 25.		25 and under 30.		30 and under 35.		35 and under 40.		40 and upwards.		Total.	
	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.
Royal Artillery	3	..	18	..	84	4	53	..	12	1	1	..	171	5
2nd Bn. 16th Regiment	22	..	122	..	366	3	93	..	36	2	9	..	648	5
84th Regiment	32	..	215	1	261	2	96	1	33	..	1	..	638	4
Total	57	..	355	1	711	9	242	1	81	3	11	..	1,457	14
Additional Artillery	..	..	13	..	32	..	7	..	7	..	2	..	61	..
1st West India Regiment	..	..	81	..	30	3	48	1	18	1	..	..	177	5
2nd „ „	4	..	211	1	50	5	32	2	7	..	..	..	304	8
3rd „ „	122	2	370	4	214	6	66	..	46	2	..	..	818	14
4th „ „	10	1	213	2	159	3	13	2	3	1	1	..	399	9
Military Labourers	6	..	53	1	57	1	30	..	16	..	22	..	184	2
Total	142	3	941	8	542	18	196	5	97	4	25	..	1,943	38

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 19, showing the Admissions into Hospital and Deaths among the Troops serving at St. Helena, the Cape of Good Hope, Mauritius, Ceylon, and the Straits Settlements, in the year 1868.

Stations	St. Helena.		Cape of Good Hope.		Mauritius.		Ceylon.				Straits Settlements.	
							White.		Black.			
Strength	421		3,630		1,318		823		1,028		183	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
I. *Zymotic Diseases.*												
1. Miasmatic Diseases:												
Varicella	..	..	1	..	..	..	..	..	3	..	..	..
Morbilli	..	..	1	..	..	..	..	..	2	..	..	..
Tonsillitis	5	..	92	..	6	..	5	..	1	..	1	..
Influenza	..	..	3	..	..	..	..	..	1	..	..	..
Ophthalmia	5	..	257	..	14	..	30	..	35	..	1	..
Erysipelas	..	..	10	..	..	..	2	..	2	..	1	..
Furunculus	..	..	9	..	7	..	17	..	6	..	1	..
Anthrax	1	..	2	..	1	..	..	..	..	..	1	..
Dysenteria Acuta	17	..	7	2	63	3	71	3	15	1	5	..
„ Chronica	2	..	3	..	21	..	7	..	2	1	..	..
Diarrhœa	12	..	56	1	53	..	59	..	14	1	12	..
Cholera Spasmodica	..	..	..	..	..	..	2	1	..	..	..	..
Febris Intermittens	1	..	77	..	562	4	51	3	65	2	10	..
„ Remittens	..	..	5	1	1797	14	97	1	77	4	1	..
„ Typhoides	..	..	2	1	..	..	..	..	..	..	..	..
„ Continua	8	..	181	..	6	1	16	1	..	..	4	..
Rheumatismus Acutus	6	..	101	..	15	..	14	..	11	..	4	..
„ Chronicus	26	..	112	..	38	..	1	..	15	..	2	..
Parotitis	..	..	1	..	1	..	..	..	5	..	..	..
Vaccinia	..	..	..	..	1	..	..	..	..	..	..	..
Gangræna Nosocomialis	..	..	..	..	..	..	..	..	2	..	..	..
Cynanche Trachealis	..	..	..	..	..	..	..	..	1	1	..	..
2. Enthetic Diseases:												
Syphilis Primaria	41	..	391	..	34	..	38	..	5	..	21	..
„ Secundaria	15	..	184	..	34	..	5	..	1	..	5	..
Iritis Syphilitica	2	..	13	..	1	..	..	..	1	..	..	..
Bubo	10	..	100	..	14	..	31	..	3	..	13	..
Gonorrhœa	69	..	609	..	27	..	48	..	15	..	25	..
Phymosis, &c.	..	..	1	..	1	..	1	..	..	..	2	..
Orchitis (Gonorrhœal)	4	..	26	..	3	..	3	..	1	..	3	..
Strictura Urethræ	..	..	14	1	3	..	1	..	1	..	..	..
Verrucæ	1	..	..	..	1	..	..	..	..	..	..	..
Ulcus Penis	..	..	..	..	1	..	..	..	..	..	..	..
3. Dietic Diseases:												
Scorbutus	..	..	1	..	..	..	1	..	..	..	..	..
Ebriositas	11	..	112	2	23	..	26	..	..	..	11	1

Abstract No. 19—*continued.*

Stations	St. Helena.		Cape of Good Hope.		Mauritius.		Ceylon. White.		Ceylon. Black.		Straits Settlements.	
Strength	421		3,630		1,318		823		1,028		183	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
4. Pārasitic Diseases:												
Porrigo	..	..	..	..	1	..	4	..	..	..	..	..
Scabies	3	..	15	..	1	..	6	..	25	..	..	..
Tænia Solium	..	..	3	..	5	..	2	..	..	..	1	..
Phthiriasis	..	..	2	..	..	..	..	..	..	..	..	..
Vermes	..	..	..	..	..	..	2	..	..	..	..	..
Ascaris Lumbricoides	..	..	1	..	..	..	..	..	..	..	..	..
II. *Constitutional Diseases.*												
1. Diathetic Diseases:												
Lupus	..	..	1	..	..	..	..	..	..	..	..	..
Sciatica	..	..	..	..	..	..	..	..	..	..	1	..
Podagra	..	..	..	..	1	..	..	..	..	..	..	..
Lumbago	..	..	5	..	..	..	..	..	..	..	1	..
Ischias	..	..	..	..	1	..	..	..	..	..	..	..
Anæmia	1	..	1	..	11	..	5	..	..	..	1	..
Anasarca	..	..	1	..	..	..	..	..	2	..	..	..
Tumores	..	..	..	..	2	..	..	..	..	..	..	..
Gangræna	..	..	1	..	..	..	..	..	..	..	..	..
2. Tubercular Diseases:												
Scrofula	..	..	6	..	..	..	2	..	..	..	..	..
Phthisis Pulmonalis	6	..	28	10	11	..	10	1	2	2	..	..
Hæmoptysis	2	..	7	..	3	..	1	..	..	..	..	..
III. *Local Diseases.*												
1. Nervous System:												
Meningitis	..	..	..	..	..	..	2	..	..	..	..	..
Apoplexia	..	..	1	3	1	1	..	1	1	1	1	..
Paralysis	..	..	22	..	..	..	1	..	3	..	..	..
Delirium Tremens	1	1	20	3	6	1	8	..	..	..	1	..
Mania	..	..	1	..	1	..	1	..	..	..	..	..
Amentia	..	..	11	..	1	..	..	..	2	..	..	..
Epilepsia	..	..	11	..	..	..	1	..	..	..	1	..
Cephalæa	7	..	25	..	4	..	4	..	1	1	4	..
Neuralgia	..	..	9	..	..	..	3	..	..	..	1	..
Tumor Cerebri	1	1	..	..	..	..	..	..	..	..	..	..
Dysecœa	..	..	2	..	..	..	2	..	..	..	..	..
Otitis	..	..	6	..	7	..	7	..	..	..	6	..
Cæcitas	1	..	..	..	..	..	..	..	..	..	..	..
Amaurosis	..	..	..	..	2	..	..	..	..	..	..	..
2. Circulatory:												
Pericarditis	..	..	1	..	..	..	..	..	..	..	..	..
Hypertrophia Cordis	3	..	14	..	..	..	6	..	..	..	..	..
Morbus Valv: „	6	..	12	2	9	1	2	..	1	1	6	1
Aneurisma Aortæ	..	..	1	..	..	..	..	..	..	..	..	..
Varix	1	..	2	..	1	..	..	..	..	..	..	..
Angina Pectoris	..	..	2	..	..	..	..	..	..	..	..	..
Palpitatio	..	..	1	..	..	..	..	..	..	..	2	..
Morbus Cordis	..	..	..	..	..	..	..	..	..	..	10	..

Abstract No. 19—*continued.*

Stations	St. Helena.		Cape of Good Hope.		Mauritius.		Ceylon. White.		Ceylon. Black.		Straits Settlements.	
Strength	421		3,630		1,318		823		1,028		183	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
3. Respiratory System:												
Laryngitis	..	..	..	..	..	..	..	..	..	..	1	..
Bronchitis Acuta	6	..	105	..	9	1	47	..	34	3	12	..
„ Chronica	..	..	15	..	9	..	10	..	3	..	..	..
Pleuritis	..	..	2	..	1	..	3	..	2	..	..	..
Pneumonia	..	..	14	5	2	1	..	..	5	..	5	..
Asthma	..	..	3	..	2	..	2	..	8	1	..	..
Apoplexia Pulmonalis	..	..	..	1	..	..	..	..	..	..	..	..
4. Digestive System:												
Gastritis	..	..	1	..	1	..	..	..	..	..	..	..
Enteritis	..	..	1	..	..	..	..	..	..	..	5	..
Peritonitis	..	..	5	1	..	..	..	..	1	1	..	..
Obstipatio	..	..	1	..	1	..	..	..	1	..	1	..
Dyspepsia	8	..	82	..	11	..	14	..	6	..	3	..
Colica	1	..	13	..	11	..	4	..	1	..	7	..
Hæmatemesis	..	..	..	..	1	..	1	..	..	..	..	..
Hernia	2	..	6	..	..	..	..	..	2	..	..	..
Hæmorrhois	7	..	25	..	3	..	4	..	..	..	..	..
Fistula in ano	..	..	1	..	..	..	1	..	..	..	..	..
Splenitis	..	..	8	..	12	..	..	..	..	..	..	..
Hepatitis Acuta	4	..	35	1	16	..	16	..	4	1	1	..
„ Chronica	..	..	17	..	11	1	4	1	..	..	3	..
Icterus	..	..	2	..	2	1	6	..	..	..	1	..
Ascites	..	..	2	..	..	..	..	..	..	..	..	..
5. Urinary System:												
Nephritis	1	..	2	..	1	..	..	..	..	..	..	..
Nephria	..	..	3	..	1	..	..	..	..	..	..	..
Ischuria	..	..	1	1	..	..	..	..	..	..	..	..
Hæmaturia	..	..	1	..	..	..	..	..	..	..	..	..
Cystitis	..	..	2	..	..	..	1	..	..	..	..	..
Enuresis	1	..	3	..	1	..	7	..	..	..	..	..
Diuresis	..	..	1	..	..	..	..	..	..	..	..	..
Morbus Prostaticus	..	..	1	..	..	..	..	..	..	..	..	..
6. Reproductive System:												
Varicocele	..	..	2	..	..	..	..	..	..	..	..	..
Hydrocele	1	..	3	..	..	..	1	..	1	..	1	..
Orchitis (not Gonorrhœal)	6	..	60	..	12	..	5	..	13	..	..	..
7. Locomotive System:												
Arthritis	..	..	2	..	2	..	..	..	..	..	..	..
Synovitis	..	..	6	..	7	..	..	..	..	..	..	..
Contractura	..	..	3	..	..	..	..	..	..	..	2	..
Periostitis	..	..	5	..	4	..	..	..	..	..	..	..
Caries	..	..	4	..	1	..	1	..	..	..	..	..
Necrosis	..	..	5	..	..	..	..	..	..	..	..	..
Hydrarthrus	..	..	2	..	..	..	..	..	..	..	..	..
8. Integumentary System:												
Urticaria	..	..	..	..	1	..	..	..	..	..	..	..
Eczema	..	..	19	..	3	..	5	..	2	..	..	..
Herpes	1	..	6	..	3	..	1	..	..	..	2	..

Abstract No. 19—*continued.*

Stations	St. Helena.		Cape of Good Hope.		Mauritius.		Ceylon. White.		Ceylon. Black.		Straits Settlements.	
Strength	421		3,630		1,318		823		1,028		183	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Impetigo	..	..	8	..	..	..	1	..	..	..	1	..
Psoriasis	..	..	6	..	1	..	2	..	..	..	..	..
Lichen	..	..	..	..	..	..	1	..	..	..	..	..
Pityriasis	..	..	..	..	1	..	..	..	..	..	..	..
Pemphigus	..	..	..	..	..	..	1	..	..	..	..	..
Trichosis	..	..	..	..	..	..	..	..	..	..	1	..
Roseola	..	..	..	..	..	..	1	..	..	..	..	..
Ecthyma	..	..	4	..	..	..	..	..	..	..	..	..
Acne	..	..	1	..	..	..	..	..	..	..	..	..
Phlegmon	12	..	109	..	21	..	18	..	6	..	16	..
Abscessus	4	..	67	..	23	..	18	..	11	1	2	..
Paronychia	..	..	15	..	3	..	6	..	2	..	..	..
Ulcus	19	..	278	..	24	..	75	..	42	..	34	..
IV. *Developmental Diseases.*												
4. Diseases of Nutrition:												
Atrophia	3	..	19	..	8	..	5	..	1	..	2	..
V. *Violent Deaths or Diseases.*												
1. Accidental:												
Ambustio	..	..	8	..	4	..	1	..	..	..	..	..
Explosio	..	..	2	..	..	..	..	..	..	..	..	..
Insolatio	..	..	1	..	..	..	2	..	..	..	..	..
Submersio	..	..	..	2	..	2	..	3	..	..	..	..
Fractura	2	..	25	1	2	..	..	..	1	..	1	..
Amputatio	..	..	2	..	..	..	1	..	..	..	..	..
Contusio	14	..	240	..	23	..	28	..	9	..	12	..
Commotio	..	..	2	..	..	..	..	..	..	..	..	..
Vulnus Sclopetarium	..	..	3	..	..	..	..	..	..	..	2	2
„ Incisum	12	..	96	..	24	..	19	..	9	..	13	..
Luxatura	1	..	4	..	6	..	1	..	..	..	..	..
Subluxatio	10	..	60	..	14	..	10	..	2	..	..	..
Vesiculæ Pedis	..	..	18	..	..	..	5	..	1	..	..	..
Morsus Canis	..	..	..	..	1	..	..	..	1	..	..	..
„ Serpentis	..	..	..	..	..	..	..	..	1	..	..	..
„ Hominis	..	..	1	..	..	..	..	..	..	..	..	..
3. Homicidal:												
Ruptura Renis	..	..	..	1	..	..	..	..	..	..	..	..
4. Suicidal:												
Venenatio	..	..	..	..	1	1	..	..	..	..	..	..
Vulnus Sclopetarium	..	..	1	2	..	..	..	..	..	..	..	..
„ Incisum	..	..	2	..	..	..	..	..	..	..	..	..
6. Punitus	..	..	3	..	..	..	..	..	..	..	..	..
Total	383	2	4,027	41	3,079	32	923	15	490	22	287	4

Abstract No. 19—*continued.*

CAUSES of the Deaths of the Invalids.

	St. Helena.	Cape.	Mauritius.	Ceylon. White.
Dysenteria..	..	..	..	1
Phthisis Pulmonalis ..	..	1	1	..
Epilepsia	..	1	..	..
Morbus Valv : Cordis ..	..	..	1	..
Aneurisma..	..	1	1	..
Ascites ..•	..	..	1	..
Cystitis	..	..	..	1
Caries	..	..	..	1
Total	..	3	4	3

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 20, showing the Number of Men sent home from St. Helena, the Cape of Good Hope, Mauritius, and Ceylon, in 1868, as Invalids, and of Invalids finally discharged the Service in these Colonies and in England.

Diseases.	St. Helena.		Cape.			Mauritius.		Ceylon.		
								White.		Black.
	Sent Home.	Discharged at Netley.	Sent Home.	Discharged at Netley.	Discharged in the Colony.	Sent Home.	Discharged at Netley.	Sent Home.	Discharged at Netley.	Discharged in the Colony.
I. *Zymotic Diseases.*										
1. Miasmatic:										
Ophthalmia	..	..	23	7	..	1	2	..	..	5
Erysipelas	..	..	1	..	..	..	..	..	..	..
Dysenteria Acuta	..	..	1	..	..	..	..	1	..	..
„ Chronica	2	..	2	1	..	2	..	1	..	..
Diarrhœa	..	..	1	..	..	..	..	..	..	..
Febris Intermittens	..	..	..	..	..	3	4	..	..	1
„ Remittens	..	..	..	..	..	28	..	..	..	..
„ Continua	..	..	..	..	..	..	..	1	..	..
Rheumatismus Acutus	..	..	2	..	..	..	..	..	..	1
„ Chronicus	4	2	21	5	..	1	..	..	..	17
2. Enthetic:										
Syphilis Primaria	..	..	1	..	..	..	..	..	..	..
„ Secundaria	1	1	22	8	..	1	2	1	1	..
Iritis Syphilitica	..	..	1	1	..	..	..	..	..	..
Bubo	..	..	..	..	..	..	..	1	..	..
Orchitis (Gonorrhœal)	..	..	1	..	..	..	..	1	..	..
3. Dietic:										
Scorbutus	..	..	1	..	..	..	..	..	..	..
II. *Constitutional Diseases.*										
1. Diathetic:										
Anæmia	..	..	..	..	..	3	..	..	..	..
Anasarca	..	..	2	..	..	..	..	..	..	..
Lupus	..	..	1	..	..	..	..	..	..	..
2. Tubercular	..									
Scrofula	..	..	4	..	..	..	..	..	..	..
Phthisis Pulmonalis	4	1	17	17	..	4	10	6	3	..
Morbus Coxarius	..	..	..	1	..	..	..	..	..	..
III. *Local Diseases.*										
1. Nervous System:										
Paralysis	..	..	9	4	..	..	..	..	..	..
Mania	..	..	..	..	..	..	..	1	..	..
Amentia	..	..	2	..	..	..	..	..	..	2
Epilepsia	..	..	6	6	1	1	..	..	..	..
Cephalæa	1	..	1	..	..	..	..	3	1	..
Dysecœa	..	..	..	1	..	..	..	..	1	..
Cæcitas	..	..	..	2	..	..	1	..	1	..
2. Circulatory System:										
Hypertrophia Cordis	..	..	14	2	..	..	..	1	..	..
Morbus Valv. „	5	4	2	10	..	..	3	..	..	..
Aneurisma Aortæ	..	..	3	2	..	..	..	..	..	..
Varix	2	2	4	5	..	..	1	..	..	..
Palpitatio	..	..	..	3	..	..	..	..	..	..

Abstract No. 20—*continued.*

Diseases.	St. Helena.		Cape.			Mauritius.		Ceylon.		
								White.		Black.
	Sent Home.	Discharged at Netley.	Sent Home.	Discharged at Netley.	Discharged in the Colony.	Sent Home.	Discharged at Netley.	Sent Home.	Discharged at Netley.	Discharged in the Colony.
3. Respiratory System:										
Bronchitis Acuta	..	..	2	..	..	..	..	..	..	..
„ Chronica ..	..	..	1	1	..	2	1	2	..	1
Asthma	..	..	1	..	..	..	..	..	..	1
4. Digestive System:										
Dyspepsia	..	..	..	..	..	..	..	2	..	..
Hernia	3	3	3	5	..	..	..	..	..	1
Hæmorrhois	..	..	1	..	..	..	..	..	..	..
Splenitis	..	..	2	..	..	..	..	..	..	..
Hepatitis Acuta	..	..	1	..	..	..	..	..	..	..
„ Chronica ..	1	..	1	3	..	..	..	..	1	..
Icterus	..	..	2	..	..	..	..	..	..	..
5. Urinary System:										
Nephritis	..	..	1	..	..	..	..	..	..	..
Nephria	..	..	..	1	..	..	..	..	..	..
6. Reproductive Syst.:										
Varicocele	..	..	..	1	..	..	..	..	..	..
Hydrocele	..	..	..	..	..	..	..	..	..	1
Orchitis (not Gonorrhœal)	1	..	..	..	..	..	..	..	..	..
7. Locomotive System:										
Arthritis	..	..	2	..	..	..	..	..	..	..
Synovitis	..	..	1	..	..	..	..	..	..	..
Contractura	..	1	1	1	..	..	..	..	..	..
Exostosis	..	..	..	1	..	..	..	..	..	..
Caries	..	..	2	1	..	..	..	1	..	..
Necrosis	..	..	2	..	..	..	..	..	1	..
Hydrarthrus	..	..	1	..	..	..	..	..	..	..
Curvatura Spinalis ..	..	..	..	1	..	..	..	..	..	..
8. Integumentary Syst.:										
Psoriasis	..	..	1	..	..	..	..	1	..	..
Abscessus	..	..	2	..	..	..	..	..	1	..
Ulcus	..	..	4	1	..	..	1	..	..	..
IV. Developmental Diseases.										
4. Diseases of Nutrition:										
Atrophia	2	2	12	1	..	..	..	..	1	..
V. Violent Deaths or Diseases.										
1. Accidental:										
Fractura	..	..	2	1	..	..	..	..	..	..
Amputatio	..	..	4	1	..	..	..	1	..	..
Contusio	..	..	2	..	..	1	..	..	..	..
Commotio	..	..	1	..	..	..	..	..	..	..
Vulnus Sclopetarium ..	..	..	1	1	..	..	..	..	..	..
„ Incisum	..	..	1	..	..	..	..	..	..	..
Luxatura	..	..	..	..	..	1	..	..	..	..
Subluxatio	..	1	1	..	..	..	..	..	..	..
Total	26	17	197	95	1	48	25	24	11	30

APPENDIX No. XXVI—*continued.*

EXTRACT No. 21, showing the Ages of the Troops serving at the Cape of Good Hope, and the Deaths at each Age, during the Year 1868.

... ...	Under 20 Years.		20 and under 25.		25 and under 30.		30 and under 35.		35 and under 40.		40 and upwards.		Total.	
	Strength.	Died.	Strength.	Died.	Strength.	Died.	Strength.	Died.	Strength.	Died.	Strength.	Died.	Strength.	Died.
1st Bn. 9th Foot ..	21	1	173	2	323	1	162	3	54	1	14	..	747	8
2nd „ 11th „ ..	44	..	201	3	225	7	186	3	95	1	2	..	753	14
2nd „ 20th „ ..	16	..	100	..	550	3	64	2	26	..	5	..	761	5
99th Foot, including Wing at St. Helena	20	..	89	..	292	3	190	1	56	1	10	..	657	5
Cape Mounted Rifles	232	..	123	..	61	2	37	1	23	2	18	3	494	8
Total	333	1	686	5	1,451	16	639	10	254	5	49	3	3,412	40

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 22, showing the Admissions into Hospital and Deaths among the Troops serving in Australia, New Zealand, China, and Japan, during the year 1868.

Stations	Australia.		New Zealand.		China.				Japan.	
					White.		Black.			
Strength	1,690		841		668		691		785	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
I. *Zymotic Diseases.*										
1. Miasmatic:										
Variola	..	..	..	..	1	..	13	..	1	..
Varioloides	..	..	..	..	..	..	1	..	..	..
Varicella	..	..	..	..	..	..	6	..	..	..
Tonsillitis	16	..	13	..	7	..	2	..	10	..
Influenza	9	..	19	..	1	..	..	..	8	..
Ophthalmia	36	..	54	..	3	..	3	..	164	..
Erysipelas	2	..	..	..	..	..	1	..	1	..
Furunculus	7	..	16	..	4	..	4	..	3	..
Anthrax	1	..	1	..	..	..	1	1	..	..
Dysenteria Acuta	6	1	1	..	20	..	18	..	..	..
„ Chronica	..	..	..	..	2	..	..	..	..	..
Diarrhœa	22	..	27	..	61	..	95	..	12	..
Febris Intermittens	7	..	..	..	133	..	164	1	2	..
„ Remittens	4	..	..	..	29	1	6	1	1	..
„ Typhoides	1	..	..	..	2	..	..	..	..	..
„ Continua	21	..	9	..	5	..	12	2	8	..
Rheumat: Acutus	31	..	17	..	8	..	56	..	11	..
„ Chronicus	13	..	7	..	7	..	5	..	28	..
Parotitis	..	..	..	..	..	..	15	..	..	..
2. Enthetic:										
Syphilis Primaria	112	..	5	..	31	..	8	..	213	..
„ Secundaria	36	..	4	..	10	..	5	..	49	..
Iritis Syphilitica	..	..	..	..	1	..	..	..	3	..
Bubo	16	..	2	..	8	..	2	..	32	..
Gonorrhœa	218	..	38	..	60	..	12	..	122	..
Phymosis, &c.	2	..	..	..	..	..	3	..	2	..
Orchitis (Gonorr:)	13	..	3	..	3	..	2	..	10	..
Strictura Urethræ	6	..	2	..	6	..	2	..	2	..
Verrucæ	..	..	1	..	1	..	..	..	1	..
Rheumat: Gonorr:	..	..	..	..	1	..	..	..	..	..
Ulcus Penis	..	..	..	..	1	..	..	..	1	
3. Dietic:										
Purpura	..	..	..	..	1	..	..	..	..	
Ebriositas	59	..	37	..	25	..	3	..	34	..
										..
4. Parasitic:										
Scabies	4	..	2	..	..	..	14	..	6	
Tænia Solium	..	..	..	..	1	..	..	..	..	..
Ascaris Lumbricoides	..	..	..	..	..	..	2		..	..
Dracunculus	..	..	..	..	..	..	6		..	..

Abstract No. 22—*continued.*

Stations	Australia.		New Zealand.		China.				Japan.	
					White.		Black.			
Strength	1,690		841		668		691		785	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
II. *Constitutional Diseases.*										
1. Diathetic:										
Lumbago	1	..	4	..	2	..	4	..	3	..
Ischias	..	..	2	..	..	..	..	..	..	..
Anæmia	..	..	1	..	1	..	2	1	5	..
Anasarca	1	..	..	..	..	..	9	1	1	..
Tumores	..	..	1	..	2	..	..	..	..	..
2. Tubercular:										
Scrofula	3	..	2	..	..	..	1	..	1	..
Phthisis Pulmonalis	22	5	3	3	14	1	2	1	6	2
Hæmoptysis	3	..	..	..	1	..	1	..	..	..
Abscessus Psoanus	..	..	..	..	..	..	..	..	1	..
III. *Local Diseases.*										
1. Nervous Syst.:										
Encephalitis	1	1	..	..	..	..	..	..	..	..
Meningitis	..	..	..	..	..	..	1	..	..	..
Apoplexia	1	3	..	..	..	..	..	..	..	..
Paralysis	2	..	2	..	1	..	3	..	1	..
Delirium Tremens	7	..	2	..	15	2	1	..	1	1
Mania	1	..	..	..	..	..	1	..	3	..
Amentia	5	..	4	..	..	..	1	..	..	..
Epilepsia	..	..	1	..	3	..	..	..	2	..
Tetanus	1	1	..	..	..	..	..	..	..	..
Cephalæa	4	..	16	..	6	..	2	..	2	..
Neuralgia	..	..	7	..	3	..	..	..	..	..
Odontalgia	..	..	..	..	1	..	..	..	..	..
Dysecœa	1	..	1	..	..	..	..	..	..	..
Otitis	4	..	11	..	5	..	1	..	..	..
Cæcitas	3	..	..	..	..	..	..	..	..	..
Amaurosis	..	..	2	..	..	..	..	..	..	..
2. Circulatory Syst.:										
Pericarditis	1	..	..	..	..	..	1	..	2	..
Hypertrophia Cordis	1	..	1	..	1	..	..	..	..	..
Morbus Valv: „	..	1	4	..	4	1	1	..	3	2
Aneurisma Aortæ	1	3	3	3	..	..	1	1	..	..
Varix	3	..	..	..	..	..	..	..	..	..
Palpitatio	..	..	..	..	2	..	..	..	..	..
3. Respiratory Syst.:										
Laryngitis	..	..	..	..	..	..	..	..	1	..
Bronchitis Acuta	51	..	67	..	7	..	52	1	21	..
„ Chronica	7	..	2	..	1	..	4	..	3	..
Pleuritis	10	..	3	..	2	..	5	..	7	..
Pneumonia	6	..	7	1	2	1	10	3	13	4

Abstract No. 22—*continued.*

Stations	Australia.		New Zealand.		China. White.		China. Black.		Japan.	
Strength	1,690		841		668		691		785	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
4. Digestive Syst.:										
Pharyngitis	..	..	..	..	1	..	..	..	..	..
Glossitis	..	..	..	..	..	..	..	..	1	..
Gastritis	..	1	1	..	..	..	..	..	..	..
Peritonitis	..	1	..	..	..	..	..	..	..	..
Obstipatio	1	..	1	..	1	..	..	..	2	..
Dyspepsia	26	..	19	..	15	..	5	..	13	..
Colica	9	..	5	..	4	..	2	..	..	..
Hæmatemesis	1	..	..	..	..	..	..	..	..	..
Hernia	..	..	1	..	..	..	..	..	..	..
Hæmorrhois	11	..	6	..	7	..	1	..	2	..
Fistula in Ano	2	..	..	..	2	..	1	..	..	..
Splenitis	..	..	..	..	4	..	..	..	..	..
Hepatitis Acuta	1	..	2	..	9	..	..	..	3	..
,, Chronica	6	1	4	..	9	..	..	..	6	1
Icterus	10	..	1	..	2	..	2	..	3	..
Ascites	1	1	..	..	..	..	..	..	..	..
5. Urinary Syst.:										
Nephritis	..	..	..	..	1	..	..	..	1	..
Nephria	..	..	2	..	..	..	..	..	..	..
Ischuria	1	..	..	..	..	..	..	..	1	1
Hæmaturia	1	..	..	..	..	..	3	..	..	..
Lithiasis	..	..	2	..	..	..	..	..	..	..
Cystitis	..	..	2	..	1	..	1	..	..	..
Fistula in Perineo	1	..	..	..	..	..	..	..	..	..
Morbus Prostaticus	1	..	..	..	..	..	..	..	..	..
Diuresis	..	..	1	..	..	..	..	..	..	..
6. Reproductive System:										
Hydrocele	1	..	..	..	1	..	2	..	1	..
Orchitis (not Gon:)	9	..	4	..	9	..	7	..	10	..
Sarcocele	..	..	..	..	1	..	..	..	..	..
7. Locomotive Syst:										
Arthritis	1	..	..	..	..	..	..	..	..	..
Synovitis	..	..	..	..	1	..	..	..	..	..
Contractura	1	..	2	..	1	..	..	..	..	..
Periostitis	..	..	7	..	..	..	1	..	..	..
8. Integumentary System:										
Urticaria	2	..	..	..	2	..	..	..	..	..
Eczema	12	..	10	..	5	..	3	..	..	..
Herpes	1	..	1	..	..	..	1	..	2	..
Impetigo	..	..	..	..	..	..	..	..	1	..
Psoriasis	..	..	1	..	..	..	1	..	2	..
Mentagra	2	..	..	..	..	..	..	..	..	..
Ecthyma	1	..	1	..	..	..	..	..	..	..
Acne	..	..	2	..	..	..	..	..	..	..
Pemphigus	..	..	..	..	1	..	1	..	..	..

Abstract No. 22—*continued.*

Stations	Australia.		New Zealand.		China. White.		China. Black.		Japan.	
Strength	1,690		841		668		691		785	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Lepra	..	..	..	..	..	..	4	1	..	..
Phlegmon	36	..	13	..	7	..	3	..	22	..
Abscessus	21	..	5	..	13	..	13	..	8	..
Paronychia	8	..	5	..	5	..	2	..	2	..
Ulcus	43	..	16	..	27	..	20	..	33	..
IV. *Developmental Diseases.*										
Atrophia	..	..	1	..	1	..	18	1	..	..
Asthenia	..	..	..	..	..	..	..	..	1	..
V. *Violent Deaths or Diseases.*										
1. Accidental:										
Ambustio	3	..	1	..	..	..	2	..	2	..
Submersio	..	..	..	..	..	1	..	..	1	..
Fractura	4	..	5	..	4	..	2	1	10	..
Contusio	68	..	48	..	37	..	7	..	34	..
Vulnus Sclopetarium	1	1	..	..	..	..	..	..	1	..
,, Incisum	29	..	19	..	25	..	5	..	20	..
Luxatura	1	..	28	..	1	..	9	..	..	..
Subluxatio	38	..	..	..	15	..	..	..	10	..
Vesiculæ Pedis	3	..	8	..	..	..	..	..	1	..
4. Suicidal:										
Vulnus Sclop:	..	..	..	..	..	..	1	1	..	..
Suspendium	..	1	..	..	..	..	..	..	..	..
6. Punitus	..	..	2	..	..	..	..	..	..	..
No appreciable disease	..	..	..	..	..	..	1	..	..	..
Total	1,139	21	630	7	727	7	682	17	993	11

CAUSES of the Deaths of the Invalids.

	Australia.	New Zealand.	China.
Phthisis Pulmonalis	1	..	1
Caries	..	..	1
Total	1	..	2

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 23, showing the Number of Men sent home from Australasia and China, in 1868, as Invalids, and the Number discharged the Service as Invalids in Australasia and in England.

Stations	Australasia.			China and Japan.	
Average Strength	2,531			1,453	
Diseases.	Sent Home as Invalids.	Discharged the Service. In Colony.	Discharged the Service. In England.	Sent Home as Invalids.	Discharged at Netley.
I. Zymotic Diseases.					
1. *Miasmatic:*					
Ophthalmia	6	..	4	..	..
Dysenteria	..	..	..	1	..
Diarrhœa	..	..	..	1	..
Febris Intermittens	1	..	..	2	..
Rheumatismus Chronicus	3	..	..	1	..
2. Enthetic:					
Syphilis Secundaria	..	..	..	..	1
II. Constitutional Diseases.					
1. Diathetic:					
Anæmia	..	..	..	1	..
2. Tubercular:					
Scrofula	1	..	..	..	..
Phthisis Pulmonalis	9	1	5	7	..
III. Local Diseases.					
1. Nervous System:					
Paralysis	3	..	..	1	1
Mania	1	..	..	..	..
Amentia	1	..	..	..	..
Epilepsia	..	..	..	2	..
Dysecœa	..	1	..	..	..
Cæcitas	1	..	..	..	..
Amaurosis	1	..	..	..	..
2. Circulatory System:					
Hypertrophia Cordis	1	..	..	1	
Morbus Valvæ Cordis	3	1	2	2	
Aneurisma Aortæ	2	..	..	..	
3. Respiratory System:					
Bronchitis Chronica	3	1	..	..	

Abstract No. 23—*continued.*

Stations	Australasia.			China and Japan.	
Average Strength	2,531			1,453	
Diseases.	Sent Home as Invalids.	Discharged the Service.		Sent Home as Invalids.	Discharged at Netley.
		In Colony.	In England.		
4. Digestive System:					
Splenitis	..	..	1	2	..
Hepatitis Chronica	..	..	..	3	..
5. Urinary System:					
Nephritis	..	..	..	1	..
7. Locomotive System:					
Contractura	..	..	..	1	..
Necrosis	1	..	..	..	..
8. Integumentary System:					
Eczema	..	..	..	1	..
IV. *Developmental Diseases.*					
Atrophia	..	..	1	..	2
V. *Violent Deaths or Diseases.*					
1. Accidental:					
Fractura	..	..	2	1	..
Subluxatio	..	..	..	1	..
Total	37	4	15	29	4

APPENDIX No. XXIV—*continued.*

ABSTRACT No. 24, showing the Ages of the Troops serving in Australasia, and the Deaths at each Age, during the Year 1868.

Age	Under 20.		20 and under 25.		25 and under 30.		30 and under 35.		35 and under 40.		40 and upwards.		Total.	
	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.
7th Battery 2nd Brigade R.A. ..	5	..	29	1	49	..	15	2	2	..	..	..	100	3
2nd Bn. 14th Foot	1	..	114	..	278	3	391	1	125	1	..	..	909	5
2nd „ 18th „	8	..	76	..	536	3	139	1	47	2	10	..	816	6
50th Foot	8	..	168	..	265	5	199	4	83	1	20	..	743	10
Total	22	..	387	1	1,128	11	744	8	257	4	30	..	2,568	24

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 25, showing the Admissions into Hospital and Deaths among Her Majesty's European Troops serving in Bengal, Madras, and Bombay, during the Year 1868.

Stations	Bengal.		Madras.		Bombay.	
Average Strength	32,909		10,158		9,820	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
I. *Zymotic Diseases.*						
1. Miasmatic:						
Variola	14	..	11	..	7	..
Varioloides	4	..	3	1	1	..
Varicella	4	..	2	..	2	..
Morbilli	23	..	3	..	8	..
Scarlatina	2	..	..	..	2	1
Tonsillitis	562	1	148	..	133	..
Influenza	167	1	30	..	25	..
Ophthalmia	824	..	351	..	325	..
Erysipelas	45	..	18	1	20	..
Furunculus	398	..	173	..	72	..
Anthrax	18	..	3	..	1	..
Dysenteria Acuta	1,116	45	530	14	280	8
„ Chronica			311	7		4
Diarrhœa	2,531	15	793	2	408	1
Cholera Spasmodica	71	53	10	7	14	8
Febris Intermittens	10,030	7	1,259	1	2,358	3
„ Remittens	1,314	33	198	4	165	7
„ Icterodes	1	..	..	..	..	..
„ Typhoides	70	40	9	6	1	1
„ Typhus	2	1	..	..	1	..
„ Continua	3,254	27	462	3	399	3
Rheumatismus Acutus	1,682	3	174	..	401	2
„ Chronicus			291	..		
Parotitis	11	..	9	..	7	..
Pyæmia	1	..	..	..	..	..
Equinia	..	..	..	..	1	..
Cynanche Trachealis	3	..	..	..	..	..
Pertussis	1	..	..	..	..	..
Vaccinia	5	..	..	..	..	..
2. Enthetic:						
Syphilis Primaria	1,822	..	897	..	655	..
„ Secundaria	770	4	460	1	322	2
Iritis Syphilitica	26	..	12	..	4	..
Cachexia Syphiloidea	..	..	3	..	5	..
Bubo	640	..	328	..	232	..
Gonorrhœa	2,608	..	743	..	645	..
Phymosis, &c.	29	..	14	..	14	..
Orchitis (Gonorrhœal)	184	..	45	..	36	..
Strictura Urethræ	108	1	21	..	28	..
Verrucæ	27	..	10	..	..	..
Ulcus Penis	..	..	93	..	..	..
Dietic:						
Scorbutus	21	..	4	..	13	..
Purpura	3	..	3	..	..	..

Abstract No. 25—*continued.*

Stations	Bengal.		Madras.		Bombay.	
Average Strength	32,909		10,158		9,820	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Ebriositas	767	6	591	5	200	3
Bronchocele	2	..	..	..	..	..
4. Parasitic:						
Aphthæ	4	..	..	..	..	..
Porrigo	10	..	2	..	2	..
Scabies	43	..	23	..	20	..
Tænia Solium	201	..	31	..	24	..
Dracunculus	3	..	22	..	13	..
Vermes	4	..	4	..	2	..
Ascaris Lumbricoides	7	..	1	..	..	..
Phthiriasis	..	..	..	..	1	..
II. *Constitutional Diseases.*						
1. Diathetic:						
Podagra	7	..	3	..	2	..
Lumbago	117	..	26	..	16	..
Ischias	6	..	2	..	3	..
Anæmia	148	4	34	..	51	..
Anasarca	12	..	13	..	4	..
Tumores	14	..	4	1	1	..
Melanosis	1	1	..	..	..	..
Carcinoma	3	3	2	2	1	..
Scirrhoma	1	2	..	..	..	..
2. Tubercular:						
Scrofula	50	2	20	..	16	..
Abscessus Psoanus	1	1	1	..	3	..
Phthisis Pulmonalis	240	52	98	9	75	15
Hæmoptysis	56	1	6	..	12	..
Tuberculosis	1	..	..	..	..	..
Morbus Coxarius	..	1	..	..	..	..
III. *Local Diseases.*						
1. Nervous System:						
Encephalitis	7	2	1	1	2	2
Meningitis	6	1	1	1	1	..
Abscessus Cerebri	..	1	1	1	..	..
Apoplexia	17	19	7	13	..	..
Paralysis	54	5	12	2	22	1
Delirium Tremens	139	11	69	5	54	3
Mania	30	..	12	..	8	..
Amentia	53	1	18	1	18	..
Epilepsia	97	..	38	2	22	..
Convulsio	8	..	3	..	4	..
Tetanus	2	2	..	..	..	..
Rabies	1	1	..	..	..	..
Chorea	10	..	..	..	2	..
Cephalæa	521	..	192	..	96	..
Neuralgia	113	..	21	..	11	..
Odontalgia	10	..	5	..	2	..
Polypus Auris	..	..	2	..	..	..
Dysecœa	14	..	21	..	5	..

Abstract No. 25—*continued.*

Stations	Bengal.		Madras.		Bombay.	
Average Strength	32,909		10,158		9,820	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Otitis	323	..	75	..	39	..
Iritis	..	..	1	..	..	..
Sclerotitis	1	..	..	..	..	..
Hœmeralopia	1	..	..	..	..	..
Nyctalopia	1	..	..	..	..	..
Myopia	1	..	..	..	..	..
Amaurosis	2	..	1	..	..	..
Cæcitas	4	..	3	..	9	..
2. Circulatory System:						
Carditis	4	..	9	1	8	1
Pericarditis	18	4	2	1	6	..
Hypertrophia Cordis	106	4	10	..	27	2
Atrophia „	2	1	..	..	2	..
Degeneratio „	7	5	3	..	..	2
Palpitatio „	22	..	5	..	..	..
Angina Pectoris	11	..	2	..	4	..
Morbus Valv: Cordis	160	16	65	2	35	5
Aneurisma Aortæ	21	18	17	5	5	2
Aneurisma	6	1	3	1	..	..
Varix	33	..	6	..	6	..
Phlebitis	2	..	2	..	..	..
Syncope	4	1	2	1	..	..
3. Respiratory System:						
Laryngitis	5	1	2	..	4	..
Bronchitis	1,317	9	404	..	292	..
Pleuritis	111	..	27	..	22	..
Pleurodynia	6	..	2	..	..	..
Pneumonia	84	17	17	2	21	4
Apoplexia Pulmonalis	..	1	1	1	..	..
Asthma	16	..	11	..	3	..
Emphysema	3	..	7	..	..	..
Epistaxis	19	..	..	..	4	..
4. Digestive System:						
Stomatitis	8	..	6	..	3	..
Fistula Oris	..	..	1	..	..	..
Glossitis	2	..	..	..	1	..
Pharyngitis	12	..	4	..	..	..
Æsophagitis	1	..	..	..	..	..
Gastritis	8	4	9	..	6	1
Enteritis	8	3	2	1	2	2
Peritonitis	7	5	2	1	1	..
Obstipatio	92	..	32	..	15	..
Dyspepsia	1,075	..	508	..	267	..
Colica	267	..	82	..	65	..
Hæmatemesis	13	..	1	..	..	..
Hernia	37	..	12	..	9	..
Hæmorrhois	249	..	141	..	71	..
Prolapsus Ani	1	..	..	..	..	..
Fistula in Ano	31	..	13	..	5	..
Splenitis	153	..	41	1	34	..

Abstract No. 25—*continued.*

Stations	Bengal.		Madras.		Bombay.	
Average Strength	32,909		10,158		9,820	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Hepatitis Acuta	1,586	102	403	51	404	16
„ Chronica			376	13		10
Icterus	156	3	48	..	45	1
Cirrhosis	1	1	1	..	1	1
Ascites	11	1	..	..	3	1
Melæna	1	..	..	..	..	..
5. Urinary System:						
Nephritis	16	2	7	2	12	..
Nephria	26	3	6	..	4	1
Ischuria	14	..	1	..	3	..
Hæmaturia	7	1	3	..	..	..
Lithiasis	3	..	..	..	2	..
Cystitis	9	..	..	..	3	..
Calculus Vesicæ	3	..	..	..	..	..
Fistula in Perineo	2	..	6	..	..	..
„ Urethra	2	..	..	..	..	..
Enuresis	17	..	8	..	5	..
Dysuria	..	..	1	..	..	..
Diuresis	5	..	1	..	..	..
Morbus Prostaticus	..	..	1	..	..	..
Diabetes	1	..	..	..	..	..
6. Reproductive System:						
Varicocele	10	..	3	..	..	..
Hydrocele	19	..	16	..	1	..
Orchitis (not Gonorrhœal)	460	..	138	..	108	..
Hæmatocele	1	..	..	..	..	..
Fungus Testis	2	..	..	..	..	..
7. Locomotive System:						
Arthritis	36	1	12	..	4	..
Synovitis	63	..	17	..	9	..
Hydrarthrus	2	..	3	..	2	..
Contractura	10	..	5	..	1	..
Periostitis	77	..	19	..	10	..
Exostosis	5	..	..	..	..	..
Caries	8	..	..	..	3	..
Necrosis	9	..	7	..	1	..
Curvatura Spinæ	1	..	..	..	..	..
8. Integumentary System:						
Urticaria	16	..	5	..	6	..
Eczema	123	..	41	..	23	..
Herpes	79	..	66	..	17	..
Impetigo	7	..	6	..	5	..
Psoriasis	56	..	10	..	13	..
Lichen	5	..	4	..	1	..
Pityriasis	6	..	..	..	2	..
Pemphigus	7	..	4	..	2	..
Ecthyma	8	..	4	..	1	..
Mentagra	1	..	2	..	1	..
Lepra	1	..	2	..	..	..
Favus	..	..	1	..	..	..
Rupia	10	..	3	..	..	..
Roseola	1	..	1	..	..	..

Abstract No. 25—*continued.*

Stations	Bengal.		Madras.		Bombay.	
Average Strength	32,909		10,158		9,820	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Acne	11	..	3	..	..	..
Prurigo	7	..	2	..	..	..
Tinea	2	..	..	..	..	..
Hordeolum	2	..	..	..	..	..
Pernio	1	..	..	..	..	..
Epulis	..	1	..	..	..	..
Phlegmon	1,018	..	423	..	248	..
Abscessus	417	2	231	..	88	..
Paronychia	130	..	40	..	29	..
Ulcus	1,357	..	458	..	449	..
IV. *Developmental Diseases.*						
4. Diseases of Nutrition:						
Atrophia	441	2	230	..	107	..
V. *Violent Deaths or Diseases.*						
1. Accidental:						
Ambustio	45	..	15	..	8	..
Explosio	3	1	1	..	4	..
Insolatio	253	84	33	16	40	12
Submersio	1	15	..	9	..	4
Fractura	147	6	64	..	38	1
Suffocatio	..	1	..	..	..	1
Concussio	..	..	..	..	..	1
Ictus Fulminis	1	..	..	..	..	..
Necusia	..	..	..	..	1	..
Amputatio	12	1	..	..	2	..
Extirpatio Oculi	1	..	..	..	..	..
Ruptura Hepatis	..	2	..	..	..	..
Contusio	1,705	3	689	..	515	..
Commotio	11	..	5	..	3	..
Vulnus Sclopetarium	22	..	3	..	2	..
„ Incisum	386	..	148	1	101	..
Luxatura	29	..	7	..	13	..
Subluxatio	813	..	297	..	177	..
Vesiculæ Pedis	114	..	44	..	4	..
Venenatio	2	..	2	..	3	1
Morsus Centipedis	..	..	..	..	1	..
„ Equi	1	..	1	..	1	..
„ Piscis	..	..	..	..	6	..
„ Canis	11	..	9	..	..	..
„ Simiæ	..	..	2	..	..	..
„ Serpentis	..	..	1	1	..	..
„ Hominis	1	..	1	..	..	..
„ Ursi	..	..	1	..	..	..
„ Felis	..	..	1	..	..	..
„ Scorpionis	3	..	..	..	..	..
„ Cameli	1	..	..	..	..	..
3. Homicidal:						
Vulnus Incisum	..	..	..	..	1	..
„ Sclopetarium	..	2	..	..	..	

Abstract No. 25—*continued.*

Stations	Bengal.		Madras.		Bombay.	
Average Strength	32,909.		10,158		9,820	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
4. Suicidal:						
Vulnus Sclopetarium	2	9	..	1	1	2
„ Incisum	2	1	1	2	..	..
Venenatio	..	..	..	..	1	1
Suspendium	..	..	..	1	1	..
Submersio	..	3	..	2	..	..
5. Executio	..	2	..	..	..	..
6. Punitus	1	..	..	..	4	..
Diseases not stated	23	..	35	..	..	..
Total	45,234	676	14,214	208	10,784	136

Causes of the Deaths of the Invalids.

	Bengal.	Madras.	Bombay.
I.—1. Dysenteria	11	7	1
Diarrhœa	2	3	..
Febris Intermittens	1	..	..
Rheumatismus	1	..	..
2. Syphilis Secundaria	5	2	1
II.—1. Anæmia	1	..	..
Anasarca	1	..	..
Carcinoma	1	..	1
2. Phthisis Pulmonalis	22	8	7
III.—1. Paralysis	3	..	..
Mania	1	..	..
2. Pericarditis	..	..	1
Morbus Valv: Cordis	4	..	3
Hypertrophia „	1	..	..
Aneurisma	1	..	1
3. Bronchitis	..	1	2
Pneumonia	2	3	..
4. Pharyngitis	1	..	..
Dyspepsia	..	1	..
Hepatitis	6	3	..
Ascites	2	1	..
5. Nephritis	1	..	..
8. Abscessus	1	..	..
V.—1. Submersio	..	2	..
4. Submersio	1	2	..
Total	69	33	17

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 26, showing the Number of Men sent Home as Invalids from Bengal, Madras, and Bombay, during the Year 1868. Also the Number of Invalids from India finally Discharged the Service at the Invalid Depôt in England during the Year.

Stations	Bengal.	Madras.	Bombay.	India.
Strength	32,909	10,158	9,820	52,887
Causes of Disability.	Sent home.	Sent home.	Sent home.	Discharged at Netley.
I. *Zymotic Diseases.*				
1. Miasmatic Diseases:				
Tonsillitis	..	..	1	..
Ophthalmia	10	2	15	22
Anthrax	..	1	..	..
Dysenteria Acuta	43	6	16	18
„ Chronica		72		
Diarrhœa	14	12	1	2
Febris Intermittens	67	9	21	14
„ Remittens	5	1	..	..
„ Continua	1	1	..	..
Rheumatismus Acutus	100	2	27	57
„ Chronicus		33		
2. Enthetic Diseases:				
Syphilis Primaria	1	1	31	..
„ Secundaria	84	57	..	55
Cachexia Syphiloidea	..	4	3	..
Bubo	..	1	..	..
Strictura Urethræ	4	3	3	3
4. Parasitic Diseases:				
Tænia Solium	1	..	..	..
Vermes	1	..	..	..
II. *Constitutional Diseases.*				
1. Diathetic Diseases:				
Lumbago	2	..	..	..
Anæmia	61	6	7	6
Anasarca	1	2	..	2
Tumores	1	..	..	..
Carcinoma	..	..	1	..
Morbus Coxarius	1	..	..	1
2. Tubercular Diseases:				
Scrofula	11	7	2	2
Phthisis Pulmonalis	100	46	24	138
Hæmoptysis	6	..	1	1
Abscessus Psoanus	..	..	2	..
III. *Local Diseases.*				
1. Nervous System:				
Meningitis	..	..	1	..
Encephalitis	1	..	..	..
Apoplexia	..	1	..	..
Paralysis	16	5	5	20
Mania	8	5	3	..
Amentia	19	9	9	..
Epilepsia	12	10	8	19

Abstract No. 26—*continued.*

Stations	Bengal.	Madras.	Bombay.	India.
Strength	32,909	10,158	9,820	52,887
Causes of Disability.	Sent home.	Sent home.	Sent home.	Discharged at Netley.
Convulsio	1	..	..	..
Cephalæa	21	5	4	9
Neuralgia	..	..	1	..
Chorea	1	..	1	2
Dysecœa	2	6	4	27
Otitis	..	1	1	1
Cataractes	..	2	..	..
Cæcitas	4	3	4	35
Presbyopia	1	..	..	..
Aphonia	..	1	..	..
2. Circulatory System:				
Carditis	4	5	1	..
Pericarditis	1	..	..	..
Hypertrophia Cordis	50	12	11	4
Degeneratio „	1	2	..	..
Morbus Valv: „	54	25	16	162
Palpitatio „	3	2	..	11
Angina Pectoris	..	..	..	1
Aneurisma Aortæ	4	8	..	..
Aneurisma	2	1	..	9
Varix	25	3	4	30
Atheroma	..	..	..	2
Syncope	1	..	..	..
3. Respiratory System:				
Laryngitis	1	..	..	2
Bronchitis Acuta	33	16	9	7
„ Chronica				
Pleuritis	4	1	1	1
Asthma	5	2	..	1
Emphysema	1	3	..	..
4. Digestive System:				
Pharyngitis	1	..	..	..
Peritonitis	1	..	..	..
Dyspepsia	8	3	3	15
Hernia	17	2	11	32
Hæmorrhois	4	1	1	2
Fistula in Ano	2	..	2	3
Splenitis	12	3	5	11
Hepatitis Acuta	192	18	41	81
„ Chronica		87		
Icterus	1	1	..	1
Cirrhosis	1	..	..	..
Ascites	1	..	..	..
5. Urinary System:				
Nephritis	2	1	..	..
Nephria	6	3	2	3
Cystitis	2	..	..	..
Fistula in Perineo	..	1	..	1
Enuresis	..	..	1	1
Diabetes	..	..	..	1

Abstract No. 26—*continued.*

Stations	Bengal.	Madras.	Bombay.	India.
Strength	32,909	10,158	9,820	52,887
Causes of Disability.	Sent home.	Sent home.	Sent home.	Discharged at Netley.
6. Reproductive System:				
Varicocele	5	..	..	2
Hydrocele	..	1	..	1
Orchitis (not Gonorrhœal)	3	5	1	4
7. Locomotive System:				
Arthritis	3	4	..	2
Synovitis	4	..	1	2
Contractura	8	2	1	12
Periostitis	5	1	..	2
Caries	3	..	..	2
Necrosis	2	2	..	2
Atrophia Musculorum	..	..	1	..
Curvatura Spinæ	1	..	..	..
8. Integumentary System:				
Herpes	..	1	..	..
Impetigo	..	1	..	..
Psoriasis	..	..	..	1
Phlegmon	..	1	..	..
Abscessus	3	1	1	1
Paronychia	..	..	..	2
Ulcus	19	6	4	16
IV. *Developmental Diseases.*				
4. Diseases of Nutrition:				
Atrophia	261	79	27	180
"Worn out"	3	..	..	..
V. *Violent Deaths or Diseases.*				
1. Accidental:				
Explosio	..	..	..	1
Insolatio	7	3	1	2
Fractura	14	5	7	18
Amputatio	1	..	1	10
Contusio	2	1	1	2
Commotio	1	1	1	1
Vulnus Sclopetarium	5	1	1	7
„ Incisum	1	2	3	2
Luxatura	1	1	..	4
Subluxatio	2	2	..	3
2. In Battle:				
Vulnus Sclopetarium	..	..	..	2
4. Suicidal.				
Vulnus Sclopetarium	..	..	..	1
Total	1,393	634	355	1,097

APPENDIX No. XXIV—*continued.*

ABSTRACT No. 27, showing the Ages of the Troops serving in the Bengal Presidency, and the Deaths at each Age, during the Year 1868.

	Under 20.		20 and under 25.		25 and under 30.		30 and under 35.		35 and under 40.		40 and upwards.		Total.	
	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.
4th Hussars	68	..	166	5	132	5	73	1	20	..	..	..	459	11
5th Lancers	10	..	53	1	266	2	98	4	16	6	8	1	451	14
7th Hussars	1	..	36	1	184	4	123	2	41	..	2	1	387	8
11th „	36	..	112	1	185	5	113	2	20	2	8	..	474	10
19th „	1	..	26	..	155	..	134	3	34	..	20	..	370	3
20th „	..	..	4	..	245	2	149	2	37	2	8	..	443	6
21st „	...	..	1	1	227	1	89	2	16	..	6	..	339	4
A Brigade, Royal Horse Artillery.	42	..	249	2	205	4	150	2	30	..	5	1	681	9
C „ „ „	..	..	21	1	54	1	45	2	3	..	..	..	123	4
F „ „ „	9	..	128	2	317	2	216	5	53	2	3	..	726	11
8th „ Royal Artillery ..	22	1	280	5	303	13	270	20	111	6	17	..	1,003	45
16th „ „ ..	21	..	307	13	299	17	163	4	59	2	14	..	863	36
19th „ „ ..	15	..	254	5	338	4	197	7	99	3	11	1	914	20
22nd „ „ ..	4	..	132	3	242	9	113	5	34	2	6	..	531	19
24th „ „ ..	1	..	78	1	148	..	84	2	42	2	27	..	380	5
25th „ „ ..	2	1	143	1	137	3	51	..	16	..	4	..	353	5
1st Battalion, 3rd Foot	40	3	181	7	180	3	139	1	57	1	..	..	597	15
1st „ 5th „	44	1	406	2	163	5	57	2	27	1	1	..	698	11
1st „ 6th „	170	4	306	4	180	2	107	7	28	1	3	1	794	19
1st „ 7th „	52	..	101	7	345	9	218	6	44	4	11	1	771	27
1st „ 11th „	41	1	472	3	189	4	75	2	7	2	..	..	784	12
2nd „ 12th „	20	1	303	3	292	6	109	7	55	3	7	1	786	21
1st „ 19th „	20	..	166	1	354	3	226	5	68	4	7	..	841	13
2nd „ 25th „	56	..	313	6	377	13	65	8	40	2	2	..	853	29

Abstract No. 27—*continued.*

ABSTRACT showing the Ages of the Troops serving in the Bengal Presidency, &c.—*continued.*

	Under 20.		20 and under 25.		25 and under 30.		30 and under 35.		35 and under 40.		40 and upwards.		Total.	
	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.
36th Foot	11	..	233	4	306	3	141	3	75	1	8	1	774	12
37th „	151	..	239	..	325	4	44	5	55	1	5	..	819	10
38th „	13	..	178	2	335	4	258	3	90	2	6	..	881	11
41st „	94	1	358	..	239	5	91	3	29	1	54	..	865	10
55th „	16	..	183	1	356	9	204	5	62	2	12	..	833	17
58th „	37	..	246	3	214	6	152	2	32	2	5	..	686	13
2nd Battalion 60th Foot	200	2	271	7	153	5	132	6	53	1	2	..	811	21
77th Foot	32	..	149	2	355	4	183	..	32	1	2	..	753	7
79th „	4	3	83	2	470	6	116	2	38	..	3	..	714	13
88th „	18	..	100	3	433	5	227	3	48	..	10	1	836	12
90th „	10	..	164	5	271	3	182	3	40	2	7	..	674	13
93rd „	5	..	218	1	283	2	161	5	14	3	..	..	681	11
101st „	20	..	37	..	513	6	150	7	100	1	13	2	833	16
103rd „	87	..	225	1	198	3	118	5	62	3	4	1	694	13
104th „	17	..	155	4	530	1	115	6	10	..	3	2	830	13
105th „	19	..	238	7	406	8	102	2	68	2	11	1	844	20
106th „	7	1	258	4	233	..	127	3	91	5	20	3	736	16
107th „	33	3	184	6	332	5	125	8	55	4	4	1	733	27
109th „	39	..	231	5	129	1	231	4	41	2	20	..	691	12
3rd Battalion Rifle Brigade ..	5	..	135	..	420	3	344	5	59	4	3	..	966	12
Total	1,493	22	8,123	132	12,019	200	6,267	181	2,011	82	362	19	30,275	636

Abstract No. 27—*continued.*

ABSTRACT showing the Ages of the Troops serving in the Madras Command, and the Deaths at each Age, during the Year 1868.

	Under 20 Years.		20 and under 25.		25 and under 30.		30 and under 35.		35 and under 40.		40 and upwards.		Total.	
	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.
16th Lancers	12	..	125	..	195	3	111	1	22	..	5	..	470	4
18th Hussars	3	..	124	1	226	10	27	6	15	..	3	1	398	18
D Brigade Royal Horse Artillery..	10	1	121	1	168	1	134	3	64	3	29	..	526	9
5th „ Royal Artillery ..	44	1	90	1	128	3	53	2	15	1	3	..	333	8
14th „ „	7	1	48	..	109	2	162	6	32	1	4	..	362	10
20th „ „	21	1	153	1	243	5	176	7	96	3	22	2	711	19
23rd „ „ ..	21	..	146	..	297	6	150	2	52	1	25	..	691	9
1st Battalion 1st Foot	47	..	194	1	254	7	248	9	66	1	..	1	809	19
2nd „ 10th „	21	..	126	1	577	6	123	6	46	2	14	3	907	18
2nd „ 19th „	5	..	96	4	389	5	173	5	30	2	5	..	698	16
2nd „ 21st „	11	..	147	6	478	22	133	7	47	5	1	..	817	40
2nd „ 24th „	20	..	370	..	422	10	12	3	..	2	..	1	824	16
3rd „ 60th „	29	..	169	1	232	3	317	11	59	2	1	..	807	17
76th Foot	66	..	344	1	178	9	62	6	51	1	1	..	702	17
Total ..	317	4	2,253	18	3,896	92	1,881	74	595	24	113	8	9,055	220

Abstract No. 27—*continued.*

ABSTRACT showing the Ages of the Troops serving in the Bombay Command, and the Deaths at each Age, during the Year 1868.

	Under 20 Years.		20 and under 25.		25 and under 30.		30 and under 35.		35 and under 40.		40 and upwards.		Total.	
	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.	Strength, 1st Jan.	Died.
2nd Dragoon Guards	31	..	121	..	185	..	30	1	13	1	2	..	382	2
E Brigade Royal Horse Artillery .	7	..	178	6	150	2	98	3	68	2	1	1	502	14
5th „ Royal Artillery ..	54	1	75	1	39	..	43	3	11	2	..	..	222	7
14th „ „	2	..	46	..	151	1	164	4	38	..	7	..	408	5
18th „ „	3	1	92	..	312	4	239	4	98	4	24	..	768	13
21st „ „	2	..	17	..	62	2	62	2	32	1	11	1	186	6
2nd Battalion 1st Foot	32	..	132	3	207	5	126	..	37	1	3	..	537	9
1st „ 2nd „	43	..	294	4	227	3	139	3	44	1	5	..	752	11
1st „ 23rd „	12	..	37	1	264	2	250	4	68	1	8	1	639	9
49th Regiment	72	..	243	..	260	1	151	4	35	..	3	1	764	6
82nd „	16	1	78	..	270	2	271	11	90	3	16	..	741	17
95th „	12	..	74	..	322	4	229	2	87	3	4	..	728	9
96th „	126	..	255	8	145	..	115	4	17	..	..	..	658	12
108th „	36	..	346	7	181	1	113	2	33	1	6	1	715	12
Total	448	3	1,988	30	2,775	27	2,030	47	671	20	90	5	8,002	132

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 28, showing the admissions into Hospital, Deaths, and Invaliding of the European Troops employed in Abyssinia during the Campaign of 1868.

Strength	Aggregate, 4,208; Average *Annual*, 1,492.				
		Died.		Invalids.	
Diseases.	Admitted.	In Abyssinia.	Of Invalids	Sent to England.	Discharged at Netley.
I. *Zymotic Diseases.*					
1. Miasmatic:					
Tonsillitis	20	..	..	1	..
Influenza	1	..	..	..	..
Ophthalmia	20	..	..	7	2
Furunculus	3	..	..	1	..
Dysenteria Acuta	115	13	1	14	..
„ Chronica	13	6	3	18	3
Diarrhœa	215	..	2	33	2
Febris Intermittens	209	..	..	39	5
„ Remittens	32	2	..	2	..
„ Typhoides	..	1	..	..	..
„ Continua	19	..	1	1	..
Rheumatismus Acutus	28	..	..	4	..
„ Chronicus	43	..	..	23	4
2. Enthetic:					
Syphilis Primaria	45	..	..	6	..
„ Secundaria	21	..	..	15	2
Iritis Syphilitica	1	..	..	..	..
Bubo	11	..	..	1	..
Gonorrhœa	40	..	..	2	..
Phymosis, &c.	1	..	..	..	..
Orchitis (Gonorrhœal)	1	..	..	1	..
Strictura Urethræ	5	..	..	..	..
3. Dietic:					
Ebriositas	1	1	..	..	..
4. Parasitic:					
Porrigo	1	..	..	..	..
Scabies	1	..	..	..	..
Tænia Solium	3	..	..	..	..
II. *Constitutional Diseases.*					
1. Diathetic:					
Lumbago	1	..	..	..	..
Anæmia	2	1	..	2	..
Anasarca	2	..	..	2	..
2. Tubercular:					
Scrofula	1	..	..	1	..
Phthisis Pulmonalis	7	..	..	10	9

Abstract No. 28—*continued.*

Strength	Aggregate, 4,208; Average *Annual*, 1,492.				
Diseases.	Admitted.	Died.		Invalids.	
		In Abyssinia.	Of Invalids	Sent to England.	Discharged at Netley.
III. *Local Diseases.*					
1. Nervous System:					
Paralysis	3	1	..	3	..
Delirium Tremens	1	..	..	..	..
Amentia	..	..	..	2	..
Epilepsia	2	..	..	1	..
Cephalæa	5	..	..	2	..
Neuralgia	1	..	..	..	..
Otitis	5	..	..	..	..
Cæcitas	..	..	..	1	.
2. Circulatory System:					
Pericarditis	2	..	..	..	..
Hypertrophia Cordis	3	..	..	2	..
Morbus Valvæ Cordis	2	..	..	2	16
Palpitatio	..	..	..	..	1
Aneurisma Aortæ	..	1	..	..	1
Varix	3	..	..	5	4
3. Respiratory System:					
Laryngitis	..	..	..	..	1
Bronchitis Acuta	36	..	..	1	..
„ Chronica	12	..	..	16	..
Pleuritis	4	..	..	..	..
Pneumonia	1	..	..	1	1
Asthma	..	..	..	4	..
4. Digestive System:					
Gastritis	1	..	..	..	..
Obstipatio	..	..	..	1	..
Dyspepsia	12	..	..	1	1
Colica	3	..	..	..	..
Hernia	3	..	..	1	1
Hæmorrhois	8	..	..	2	1
Fistula in ano	..	..	..	1	..
Hepatitis Acuta	41	1	1	12	..
„ Chronica	20	1	1	16	6
Icterus	3	..	..	..	..
Ascites	1	..	..	1	..
5. Urinary System:					
Nephritis	1	1	..	..	..
Nephria	..	1	..	..	2
Cystitis	1	..	..	1	..
6. Reproductive System:					
Varicocele	..	..	..	1	..
Orchitis (not Gonorrhœal)	9	..	..	4	..

Abstract No. 28—*continued.*

Strength	Aggregate, 4,208; Average *Annual*, 1,492.				
Diseases.	Admitted.	Died.		Invalids.	
		In Abyssinia.	Of Invalids	Sent to England.	Discharged at Netley.
7. Locomotive System:					
Arthritis	2	..	..	..	..
Synovitis	4	..	..	1	..
Periostitis	1	..	..	1	..
Necrosis	1	..	..	1	..
8. Integumentary System:					
Eczema	2	..	..	..	..
Herpes..	2	..	..	..	..
Psoriasis	..	..	..	1	..
Phlegmon	27	..	..	..	..
Abscessus	21	..	..	..	..
Paronychia	2	..	..	..	..
Ulcus	59	..	..	5	1
IV. *Developmental Diseases.*					
Atrophia	37	..	..	42	8
V. *Violent Deaths or Diseases.*					
1. Accidental:					
Explosio	4	..	..	..	..
Insolatio	8	10	2	1	..
Submersio	..	..	1	..	..
Fractura	4	..	..	3	2
Amputatio	..	..	..	1	..
Contusio	40	..	..	2	..
Vulnus Incisum	18	..	..	1	..
Subluxatio	23	..	..	3	..
Vesiculæ Pedis	12	..	..	1	..
Morsus Hirudinis	1	..	..	..	..
Venenatio	1	1	..	..	..
2. In *Battle*:					
Vulnus Sclopetarium	9	..	..	5	3
„ Incisum	1	..	..	..	..
Contusio	2	..	..	1	..
4. Suicidal:					
Vulnus Sclopetarium	1	1	..	..	..
5. Punitus	4	..	..	..	..
No appreciable disease	1	..	..	..	..
Total	1,332	42	12	333	76

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 29, showing the Cases of Sickness, and Deaths, among Troops on board Ship, proceeding on Foreign Service.

Stations	To Mediterranean and British America.		To West Indies and Cape of Good Hope.		To India, viâ the Cape.		To India, viâ Egypt.	
Number of Men embarked ..	6,439		860		2,581		6,183	
Average Annual Strength ..	211		148		678		593	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
I. Zymotic Diseases.								
1. Miasmatic:								
Variola	..	..	..	..	1	..	..	..
Morbilli	..	..	..	..	2	..	1	..
Scarlatina	..	..	..	..	..	..	1	..
Tonsillitis	7	..	1	..	23	..	19	..
Influenza	..	..	..	..	10	..	2	..
Ophthalmia.. ..	4	..	2	..	10	..	13	..
Erysipelas	..	..	..	..	1	..	..	..
Furunculus	..	..	..	..	8	..	..	..
Anthrax	1	..	..	..	..	..	1	..
Dysenteria Chronica	..	..	..	..	..	..	1	..
Diarrhœa	..	..	1	..	19	..	8	..
Febris Intermittens.	1	..	..	..	6	..	1	..
„ Remittens ..	..	..	..	..	1	1	..	..
„ Continua ..	4	..	2	..	7	..	16	..
Rheumatismus Acut:	1	..	2	..	11	..	7	..
„ Chron:	1	..	..	..	5	..	5	..
Parotitis	1	..	..	..	1	..	..	..
2. Enthetic:								
Syphilis Primaria ..	22	..	9	..	43	..	33	..
„ Secundaria	1	..	1	..	31	..	26	..
Iritis Syphilitica ..	..	..	..	..	1	..	..	..
Bubo	8	..	3	..	20	..	16	..
Gonorrhœa	36	..	10	..	55	..	67	..
Phymosis, &c. ..	..	..	1	..	4	..	3	..
Orchitis (Gonorrhœal)	3	..	..	..	10	..	4	..
Strictura Urethræ ..	..	..	..	..	1	..	1	..
Verrucæ	..	..	..	..	6	..	..	..
Ulcus Penis.. ..	..	..	1	..	..	..	..	..
3. Dietic:								
Ebriositas	..	..	..	..	1	..	..	..
4. Parasitic:								
Porrigo	2	..	..	..	..	..	..	..
Scabies	2	..	..	..	5	..	14	..
II. Constitutional Diseases.								
1. Diathetic:								
Lumbago	..	..	..	..	1	..	2	..
Anæmia	..	..	..	..	4	..	..	..

Abstract No. 29—*continued.*

Stations	To Mediterranean and British America.		To West Indies and Cape of Good Hope.		To India, viâ the Cape.		To India, viâ Egypt.	
Number of Men embarked ..	6,439		860		2,581		6,183	
Average Annual Strength ..	211		148		678		593	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Tumores	..	..	..	..	..	..	1	..
Cachexia	..	..	..	..	1	..	..	..
2. Tubercular:								
Scrofula	..	..	..	..	..	..	2	..
Phthisis Pulmonalis	..	..	..	..	2	2	1	..
Hæmoptysis ..	..	..	1	..	1	..	6	..
III. *Local Diseases.*								
1. Nervous Syst:								
Mania	..	..	..	..	1	..	1	..
Amentia	..	..	..	..	1	..	3	..
Epilepsia	..	..	1	..	7	..	1	..
Cephalæa	1	..	..	..	5	..	1	..
Neuralgia	..	..	..	..	5	..	..	..
Otitis	..	..	..	..	2	..	2	..
Iritis	..	..	..	..	1	..	1	..
2. Circulatory Syst:								
Pericarditis.. ..	..	..	..	..	1	1	..	..
Morbus Valv: Cordis	1	..	..	..	1	..	..	..
3. Respiratory Syst:								
Bronchitis Acuta	..	..	1	..	9	..	27	..
,, Chronica	1	..	1	..	4	1	2	..
Pleuritis	2	..	1	..	2	..	7	..
Pleurodynia ..	..	..	..	..	1	..	..	..
Pneumonia	1	..	2	..	2	..	3	1
Asthma	1	..	..	..	..	..	..	..
4. Digestive Syst:								
Obstipatio	..	..	..	..	..	..	1	..
Dyspepsia	6	..	3	..	4	..	9	..
Colica	..	..	..	..	..	..	1	..
Hernia	..	..	..	..	1	..	..	..
Hæmorrhois ..	..	..	..	..	4	..	2	..
Splenitis	..	..	..	..	1	..	..	..
Hepatitis Chronica .	..	..	..	..	2	..	..	..
Icterus	2	..	1	..	4	..	1	..
5. Urinary Syst:								
Nephritis	1	..	..	..	..	..	..	..
Hæmaturia.. ..	..	..	..	..	2	..	..	..
Cystitis	..	..	..	..	1	..	..	..

Abstract No. 29—*continued.*

Stations ..	To Mediterranean and British America.		To West Indies and Cape of Good Hope.		To India, viâ the Cape.		To India, viâ Egypt.	
Number of Men embarked ..	6,439		860		2,581		6,183	
Average Annual Strength ..	211		148		678		593	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
6. Reproductive System:								
Orchitis (not Gonorr.)	..	..	2	..	2	..	1	..
7. LocomotiveSyst:								
Arthritis	..	..	..	..	..	..	1	..
Synovitis	..	..	..	..	..	..	1	..
Contractura ..	..	..	..	..	1	..	1	..
Periostitis	..	..	..	..	1	..	1	..
8. Integumentary System:								
Eczema	..	..	1	..	..	..	7	..
Herpes	1	..	..	..	2	..	3	..
Impetigo	..	..	..	..	..	..	6	..
Psoriasis	..	..	..	..	..	..	5	..
Lichen	.	..	..	..	1	..	..	..
Pityriasis	..	..	..	..	1	..	..	..
Rupia	..	..	..	..	..	..	1	..
Phlegmon	3	..	1	..	25	..	13	..
Abscessus	4	..	1	..	7	..	9	..
Paronychia	..	..	..	..	1	..	2	..
Ulcus	3	..	..	..	13	..	24	..
IV. *Developmental Diseases.*								
4. Diseases of Nutrition:								
Asthenia	..	..	..	..	..	..	3	..
V. *Violent Deaths or Diseases.*								
1. Accidental:								
Ambustio	1	..	..	..	5	..	1	..
Submersio	..	..	..	1	..	..	..	..
Fractura	1	..	1	..	..	..	3	..
Contusio	6	..	..	..	20	..	31	..
Vulnus Sclopetarium	..	..	..	..	1	..	1	..
„ Incisum ..	1	..	1	..	12	..	6	..
Luxatura	1	..	..	..	1	..	2	..
Subluxatio	1	..	..	..	8	..	8	..
Vesiculæ Pedis ..	..	..	1	..	1	..	..	..
Total	132	..	52	1	454	5	443	1

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 30, showing the Cases of Sickness, and Deaths, among Troops on Board Ship, proceeding on Passage Home.

Stations	From Abyssinia.		From India, overland.		From India, by the Cape and from other Stations.	
Number of Men embarked	1,501		5,356		3,710	
Average Annual Strength	96		500		333	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
I. *Zymotic Diseases.*						
1. Miasmatic:						
Morbilli	..	..	1	..	..	..
Tonsillitis	1	..	..	..	3	..
Influenza	..	..	..	..	3	..
Ophthalmia	..	..	8	..	8	..
Erysipelas	..	..	..	..	3	..
Furunculus	..	..	2	..	1	..
Anthrax	..	..	1	..	..	..
Dysenteria Acuta	1	..	6	2	1	..
„ Chronica	..	..	5	1	..	1
Diarrhœa	6	..	8	..	18	..
Febris Intermittens	2	..	29	1	14	..
„ Remittens	..	..	4	..	..	..
„ Continua	1	..	4	..	8	..
Rheumatismus Acutus:	..	..	4	..	1	..
„ Chronicus:	..	..	6	..	14	..
2. Enthetic:						
Syphilis Primaria	4	..	23	..	27	..
„ Secundaria	..	..	9	..	27	1
Iritis Syphilitica	..	..	2	..	5	..
Bubo	1	..	9	..	8	..
Gonorrhœa	19	..	10	..	16	..
Phymosis, &c.	..	..	..	..	1	..
Orchitis (Gonorrhœal)	..	..	..	..	3	..
Strictura Urethræ	..	..	1	..	1	..
Verrucæ	..	..	..	..	1	..
3. Dietic:						
Scorbutus	1	..	..	..	..	..
4. Parasitic:						
Scabies	..	..	..	..	3	..
Tænia Solium	..	..	..	..	1	..
II. *Constitutional Diseases.*						
1. Diathetic:						
Anæmia	..	..	2	..	1	..
Anasarca	..	..	4	1	2	..
2. Tubercular:						
Scrofula	..	..	2	..	1	..
Phthisis Pulmonalis	..	..	4	1	3	..
Hæmoptysis	1	..	..	..	..	..

Abstract No. 30—*continued.*

Stations	From Abyssinia.		From India, overland.		From India, by the Cape and from other Stations.	
Number of Men embarked	1,501		5,356		3,710	
Average Annual Strength	96		500		333	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
III. *Local Diseases.*						
1. Nervous System:						
Apoplexia	..	..	..	..	1	..
Paralysis	..	..	2	..	..	..
Delirium Tremens	..	..	1	..	..	..
Mania	..	..	3	..	1	..
Amentia	..	..	2	..	1	..
Epilepsia	..	..	1	..	3	..
Neuralgia	..	..	3	..	..	..
Otitis	1	..	1	..	1	..
Nyctalopia	..	..	..	..	1	..
2. Circulatory System:						
Hypertrophia Cordis	1	1	..	..	..	..
Morbus Valv: Cordis	..	..	2	..	..	..
Syncope	..	..	1	..	..	..
3. Respiratory System:						
Bronchitis Acuta	2	..	8	..	6	..
„ Chronica	1	..	7	..	3	..
Pleuritis	..	..	2	..	4	1
Pleurodynia	..	..	2	..	..	..
Pneumonia	..	..	8	1	5	..
4. Digestive System:						
Pharyngitis	..	..	..	..	1	..
Obstipatio	..	..	1	..	..	..
Dyspepsia	..	..	2	..	1	..
Hæmatemesis	..	..	1	..	..	..
Hernia	..	..	3	..	..	..
Hæmorrhois	..	..	1	..	..	..
Splenitis	..	..	1	..	..	..
Hepatitis Acuta	2	..	1	..	1	..
„ Chronica	2	..	6	1	1	..
Icterus	..	..	3	1	..	..
5. Urinary System:						
Nephritis	..	..	1	..	..	..
Nephria	..	..	1	1	..	..
6. Reproductive System:						
Hydrocele	..	..	1	..	..	..
Orchitis (not Gonorrhœal)	..	..	1	..	4	..
7. Locomotive System:						
Synovitis	..	..	1	..	..	..
Periostitis	..	..	1	..	1	..

Abstract No. 30—*continued.*

Stations	From Abyssinia.		From India, overland.		From India, by the Cape and from other Stations.	
Number of Men embarked	1,501		5,356		3,710	
Average Annual Strength	96		500		333	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
3. Integumentary System:						
Eczema	1	..	..	..	1	..
Phlegmon	2	..	6	..	3	..
Abscessus	..	..	11	..	1	..
Paronychia	1	..	..	..	..	..
Ulcus	5	..	14	..	36	..
IV. *Developmental Diseases.*						
4. Diseases of Nutrition:						
Asthenia	..	..	12	..	4	..
V. *Violent Deaths or Diseases.*						
1. Accidental:						
Ambustio	3	..	2	..	2	..
Insolatio	..	..	1	..	..	..
Fractura	..	..	1	..	..	..
Contusio	1	..	7	..	7	..
Vulnus Incisum	..	..	2	..	2	..
Subluxatio	1	..	2	..	4	..
Vesiculæ Pedis	1	..	..	..	..	..
Total	61	1	270	10	269	3

APPENDIX No. XXVI—*continued.*

ABSTRACT No. 31, showing the Cases of Sickness and Deaths among Troops on Board Ship proceeding from one Colony or Station to another.

Stations	Between Mediterranean, West Indies, and British America.		Between India and Abyssinia.		Between other Stations.	
Number of Men Embarked	4,327		3,561		4,860	
Average Annual Strength	89		230		512	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
I. *Zymotic Diseases.*						
1. Miasmatic:						
Variola	..	..	2	..	..	..
Tonsillitis	2	..	..	..	2	..
Ophthalmia	3	..	1	..	9	..
Erysipelas	1	..	..	..	1	..
Furunculus	..	..	3	..	1	..
Dysenteria Acuta	..	..	14	..	2	..
„ Chronica	..	..	2	..	..	..
Diarrhœa	2	..	9	..	17	..
Febris Intermittens	..	..	23	..	7	..
„ Remittens	..	..	..	..	13	..
„ Continua	..	..	5	..	23	2
Rheumatismus Acutus	3	..	1	..	..	..
„ Chronicus	2	..	5	..	1	..
2. Enthetic:						
Syphilis Primaria	6	..	24	..	18	..
„ Secundaria	..	..	4	..	4	..
Iritis Syphilitica	..	..	2	..	1	..
Bubo	3	..	19	..	8	..
Gonorrhœa	3	..	25	..	6	..
Orchitis (Gonorrhœal)	1	..	1	..	1	..
Strictura Urethræ	..	..	..	..	1	..
3. Dietic:						
Purpura	..	..	..	..	1	..
Ebriositas	..	..	1	1	2	..
4. Parasitic:						
Scabies	1	..	..	..	..	..
Dracunculus	..	..	1	..	..	..
II. *Constitutional Diseases.*						
1. Diathetic:						
Lumbago	..	..	..	..	1	..
Ischias	..	..	..	..	1	..
2. Tubercular:						
Phthisis Pulmonalis	..	..	..	..	3	..
Hæmoptysis	..	..	1	..	1	..

Abstract No. 31—*continued.*

Stations	Between Mediterranean, West Indies, and British America.		Between India and Abyssinia.		Between other Stations.	
Number of Men Embarked ..	4,327		3,561		4,860	
Average Annual Strength ..	89		230		512	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
III. *Local Diseases.*						
1. Nervous System:						
Apoplexia	..	..	..	..	1	1
Delirium Tremens	2	..	..	..	1	..
Epilepsia	1	..	..	..	..	..
2. Circulatory System:						
Morbus Valv: Cordis	..	..	1	..	..	..
3. Respiratory System:						
Bronchitis Acuta	1	..	5	..	2	..
„ Chronica	..	..	1	..	1	..
Pneumonia	..	..	..	..	3	..
Epistaxis	..	..	1	..	..	..
4. Digestive System:						
Pharyngitis	..	..	..	..	1	1
Enteritis	..	..	..	..	1	1
Dyspepsia	1	..	..	..	2	..
Colica	..	..	11	..	1	..
Hæmorrhois	..	..	1	..	2	..
Splenitis	..	..	1	..	1	..
Hepatitis Acuta	..	..	3	..	..	..
„ Chronica	..	..	3	..	3	..
Icterus	..	..	1	..	4	..
5. Urinary System:						
Fistula in Perineo	..	..	..	..	1	..
6. Reproductive System:						
Orchitis (not Gonorrhœal) ..	..	..	2	..	1	..
7. Locomotive System:						
Arthritis	..	..	..	..	1	..
Synovitis	..	..	..	..	2	..
8. Integumentary System:						
Eczema	1	..	..	..	1	..
Pemphigus	..	..	..	..	1	..
Phlegmon	2	..	1	..	7	..
Abscessus	4	..	1	..	4	..
Paronychia	1	..	1	..	3	..
Ulcus	4	..	10	..	12	..

Abstract No. 31—*continued.*

Stations	Between Mediterranean, West Indies, and British America.		Between India and Abyssinia.		Between other Stations.	
Number of Men Embarked ..	4,327		3,561		4,860	
Average Annual Strength ..	89		230		512	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
IV. *Developmental Diseases.*						
4. Diseases of Nutrition:						
Asthenia	..	..	1	..	1	..
V. *Violent Deaths or Diseases.*						
I. Accidental:						
Ambustio	..	..	5	..	..	..
Insolatio	..	..	2	1	..	..
Submersio	..	..	..	2	..	..
Fractura	..	..	..	..	4	1
Contusio	4	..	10	..	10	..
Vulnus Incisum	1	..	1	..	1	..
Subluxatio	1	..	1	..	1	..
6. Punitus	..	..	..	..	2	..
No appreciable disease	1	..	..	..	..	..
Total	51	..	206	4	199	6

APPENDIX

ABSTRACT of Results of Meteorological Observations

ALDERSHOT CAMP. Lat. 51° 15′ N.

Month.	Readings of the Barometer.			Temperature of the Air.							Mean Daily Readings of			
	Mean reduced and corrected to 32°.	Highest reduced and corrected to 32°.	Lowest reduced and corrected to 32°.	Highest during Month.	Lowest during Month.	Range during Month.	Mean				Maximum in Sun's rays.	Minimum on Grass.	Hygrometer.	
							Of all the highest.	Of all the lowest.	Daily Range.	Approximate Temperature.			Dry Bulb.	Wet Bulb.
January	29·505	29·963	28·633	51·2	19·4	31·8	41·4	31·0	10·4	36·2	52·7	28·2	37·5	36·3
February ...	29·751	30·358	28·983	60·4	26·0	34·4	49·5	37·0	12·5	43·2	76·3	32·7	44·5	41·5
March	29·600	30·193	28·754	60·6	26·0	34·6	52·5	36·1	16·4	44·3	86·0	31·4	46·3	43·1
April	29·560	30·025	28·554	68·4	26·6	41·8	59·1	40·0	19·1	49·5	103·0	36·5	52·4	47·4
May	29·620	29·913	29·182	86·6	34·5	52·1	69·8	47·3	22·5	58·5	102·5	45·0	62·6	56·3
June	29·710	29·972	29·324	88·0	48·0	48·0	77·7	48·5	29·2	63·1	128·3	45·4	69·1	62·6
July	29·680	29·997	29·348	93·8	47·8	46·0	81·6	54·6	27·0	68·1	127·0	51·0	72·8	63·7
August	29·513	29·920	28·836	88·2	46·0	42·2	73·8	54·4	19·4	64·1	115·5	51·6	66·6	61·3
September ...	29·481	29·941	28·908	89·6	42·2	47·4	71·0	49·2	21·8	60·1	107·4	46·3	63·9	57·7
October... ...	29·572	29·999	28·988	65·0	30·0	35·0	57·1	40·0	17·1	48·5	98·1	37·5	50·8	47·7
November ...	29·595	30·210	28·755	58·4	24·0	34·4	46·1	34·8	11·3	40·4	60·1	31·5	42·2	40·3
December ...	29·163	29·890	28·332	56·0	32·0	24·0	50·5	40·1	10·4	45·3	59·1	36·6	46·2	44·8
Yearly Sums, Means, and Totals ...	29·562	30·015	28·883	72·2	32·9	39·3	60·8	42·7	18·1	51·7	93·0	39·5	54·6	50·2

CANTERBURY. Lat. 51° 17′ N.

January	...	...	...	53·0	12·5	40·5	43·8	29·1	14·7	36·4	...	...	39·2	38·2
February	...	...	...	60·0	25·0	35·0	52·0	34·1	17·9	43·0	..	...	46·6	45·0
March	...	...	...	60·5	24 0	36·5	54·1	34·6	19·5	44·3	...	...	49·0	46·8
April	...	...	...	72·0	24·0	48·0	60·1	35·8	24·3	47·9	...	...	54·1	52·0
May	...	...	...	86·5	29·5	57·0	73·5	42·2	31·3	57·8	...	...	67·0	65·0
June	...	...	...	89·0	37·0	52·0	76·9	40·3	36·6	58·6	...	...	69·6	67·0
July	...	...	...	96·5	45·0	51·5	80·6	52·7	27·9	66·6	...	...	73·1	69·2
August	...	...	...	87·0	41·0	46·0	76·3	50·3	26·0	63·3	...	...	69·8	66·5
September ...	...	...	...	93·5	36·5	57·0	73·7	47·6	26·1	60·6	...	...	64·5	59·4
October ...	...	...	...	69·0	29·0	40·0	59·3	37·9	21·4	48·6	...	...	53·8	51·4
November ...	...	...	...	59·0	20·0	39·0	48·5	33·9	14·6	41·2	...	...	44·4	43·2
December ...	...	...	...	57·0	26·5	30·5	52·0	37·4	14·6	44·7	...	...	48·2	46·6
Yearly Sums, Means, and Totals ...	...	...	...	73·6	29·2	44·4	62·6	39·7	22·9	51·1	...	...	56·6	54·2

CHATHAM. Lat. 51° 23′ N.

January	29·784	30·201	28·892	52·0	19·2	32·8	41·7	30·1	11·6	35·9	53·5	27·0	38·3	37·3
February	29·979	30·393	29·186	60·2	24·9	35·3	50·7	35·5	15·2	43·1	75·8	30·5	45·4	43·0
March	29·831	30·445	28·934	57·6	26·2	31·4	52·0	35·0	17·0	43·5	80·3	31·3	47·4	44·5
April	29·799	30·259	28·768	68·8	28·3	40·5	58·6	38·5	20·1	48·5	92·0	35·2	52·4	48·7
May	29·853	30·187	29·483	86·6	34·0	52·6	70·6	45·3	25·3	57·9	112·1	38·7	64·2	58·1
June	30·000	30·213	29·575	86·0	41·6	44·4	75·3	49·2	26·1	62·2	115·1	44·0	67·3	60·3
July	29·906	30·249	29·548	94·1	44·4	49·7	78·3	54·9	23·4	66·6	119·1	50·6	71·7	63·7
August	29·759	30·180	29·155	88·8	45·1	43·7	74·6	52·9	21·7	63·7	109·8	48·4	68·3	62·6
September ...	29·717	30·219	29·121	93·1	43·7	49·4	70·1	50·0	20·1	60·0	104·4	44·4	65·1	59·3
October... ...	29·809	30·263	29·361	69·6	28·5	41·1	57·2	39·5	17·7	48·3	83 6	34·7	51·9	47·9
November ...	29·860	30·472	29·025	57·2	22·6	34·6	46·7	34·2	12·5	40·4	60·3	30·5	43·1	40·5
December ...	29·421	30·034	28·544	56·8	30·2	26·6	50·0	38·0	12·0	44·0	57·9	34·1	47·1	45·0
Yearly Sums, Means, and Totals ...	29·810	30·260	29·133	72·6	32·4	40·2	60·5	41·9	18·6	51·2	88·7	37·4	55·2	50·9

No. XXVII

taken at Home Stations in the Year 1868.

Long. 0° 45′ W. Height above Sea 325 feet.

Hygrometrical Results from Glaisher's Tables.						Atmospherical Conditions.											
Mean Temperature of Dew Point.	Mean elastic Force of Vapour.	In a Cubic Foot of Air.			Mean Weight of Cubic Foot of Air.	Number of Days for mean Direction of Wind.				Number of calm, or nearly calm, Days.	Calculated from Robinson's Anemometer.		Amount of Cloud 0—10.	Ozone Scale 0—10.	Number of Days on which Rain fell.	Amount of Rain fall.	
		Mean Weight of Vapour.	Mean additional Weight required for Saturation.	Mean Degree of Humidity.		North.	East.	South.	West.		Mean daily pressure of Wind.	Mean daily Horizontal Movement of the air.				On the Ground.	25 Feet above the Ground.
											lbs. per sq. foot	Miles				Inches	Inches
34·7	·201	2·3	0·3	89·7	549·8	6·50	7·00	8·00	9·50	0·00	...	344·0	8·8	2·2	18	3·71	2·90
38·0	·229	2·6	0·7	77·5	546·6	0·00	4·50	6·00	18·50	0·00	...	390·0	7·6	2·1	10	0·93	0·45
39·5	·243	2·8	0·8	77·9	541·9	6·50	1·50	8·50	14·50	0·00	...	351·0	7·2	2·3	17	2·52	1·56
42·3	·271	3·1	1·3	69·0	534·6	9·00	3·50	7·00	10·50	0·00	...	380·0	7·2	1·9	13	2·60	1·69
50·9	·373	4·1	2·2	66·1	524·4	2·50	7·00	14·00	7·50	0·00	...	244·0	6·7	2·1	6	1·01	0·69
57·5	·473	5·2	2·6	66·0	519·0	7·50	5·00	5·00	12·50	0·00	...	213·0	5·8	1·8	4	0·50	0·36
56·9	·465	5·1	3·6	57·4	514·9	11·50	7·50	3·50	8·50	0·00	...	221·0	6·3	2·0	4	2·41	2·07
57·0	·466	5·1	2·0	72·1	518·0	4·50	5·50	10·50	10·50	0·00	...	269·0	6·8	2·4	15	3·27	2·58
52·6	·396	4·4	2·1	66·9	520·7	5·50	10·50	9·50	4·50	0·00	...	225·0	6·5	1·7	12	2·79	2·10
44·5	·294	3·3	0·8	79·4	536·1	5·00	2·50	7·50	16·00	0·00	...	255·0	7·3	1·9	14	2·66	1·71
38·0	·229	2·6	0·5	85·7	546·2	10·50	6·00	5·00	8·50	0·00	...	274·7	8·2	2·1	8	1·84	1·13
43·2	·280	3·2	0·4	90·2	533·6	1·00	4·00	14·00	12·00	0.00	...	331·4	8·3	2·9	28	6·68	4·39
46·3	·327	3·6	1·4	74·3	532·1	70·00	64·50	98·50	133·00	0·00	...	291·5	7·2	2·1	149	30·92	21·53

Long. 1° 5′ E. Height above Sea 80 feet.

36·9	·220	2·5	0·3	92·0	...	2·50	9·00	6·50	13·00	0·00	...	...	3·1	3·0	13	2·76	...
43·2	·280	3·2	0·5	88·8	...	4·00	0·00	6·00	19·00	0·00	...	...	3·8	2·6	10	1·44	...
44·4	·293	3·3	0·7	84·6	...	13·50	1·00	5·00	11·50	0·00	...	...	3·5	3·2	8	1·04	...
49·9	·359	4·1	0·6	85·4	...	7·50	8·50	5·50	8·50	0·00	...	...	3·5	3·4	7	1·73	...
63·7	·592	6·5	0·8	89·2	...	4·00	9·00	6·50	8·50	3·00	...	...	2·0	2·9	6	1·31	...
64·9	·616	6·8	1·1	85·0	...	6·50	4·00	4·50	10·00	5·00	...	...	2·0	2·6	4	0·43	...
66·3	·647	7·0	1·8	79·6	...	9·00	11·00	3·50	4·50	3·00	...	...	2·6	2·7	5	0·76	...
63·9	·595	6·5	1·4	81·5	...	1·00	5·00	11·50	11·50	2·00	...	...	3·4	3·4	8	2·83	...
55·1	·436	4·8	1·9	72·0	...	2·50	11·00	7·00	5·50	4·00	...	...	3·2	3·1	8	2·64	...
49·1	·347	3·9	0·7	84·2	...	8·00	4·00	4·50	12·00	1·00	...	...	3·4	2·5	10	1·84	...
41·8	·265	3·0	0·3	90·8	...	12·00	8·00	5·00	4·00	1·00	...	...	4·7	2·5	11	2·61	...
44·8	·297	3·4	0·4	88·8	...	2·50	1·50	9·00	17·00	1·00	...	...	4·7	3·8	21	4·58	...
52·0	·412	4·6	0·9	85·1	...	73·00	72·00	74·00	126·00	21·00	...	...	3·3	3·0	111	93·97	...

Long. 0° 32′ E. Height above Sea 160 feet.

																	*
35·9	·211	2·5	0·3	91·6	554·1	7·50	7·00	7·75	8·75	0·00	...	...	9·2	2·4	25	4·14	...
40·3	·249	2·9	0·6	82·6	549·6	1·00	0·00	8·00	26·00	0·00	...	...	6·7	2·7	18	0·93	...
41·3	·260	3·0	0·7	80·1	544·7	3·50	2·75	6·75	18·00	0·00	...	...	6·3	2·0	19	1·66	...
44·9	·299	3·4	1·1	76·2	538·5	6·50	7·00	6·25	9·75	0·50	...	...	7·2	1·8	15	1·61	1·53
53·0	·403	4·5	2·1	66·7	526·7	2·00	10·75	9·50	7·25	1·50	...	192·9	4·4	2·0	7	0·53	0·50
54·7	·429	4·7	2·6	64·0	526·1	6·25	7·00	6·25	9·50	1·00	...	170·7	4·1	1·9	4	0·54	0·53
57·7	·478	5·2	3·2	61·7	519·7	6·25	12·25	2·25	8·25	2·00	...	214·3	3·9	1·2	6	0·86	...
57·9	·481	5·3	2·3	69·0	520·4	1·50	6·50	10·00	12·50	0·50	...	205·5	6·3	2·4	14	2·27	2·20
54·5	·425	4·7	2·1	69·1	523·1	2·50	11·75	6·50	5·75	3·50	...	237·9	6·1	1·3	11	1·81	1·75
43·9	·288	3·3	1·1	74·9	539·2	2·25	2·25	9·25	14·75	2·50	...	188·0	5·4	1·4	13	2·53	2·45
37·4	·223	2·6	0·6	80·3	550·1	9·25	5·75	6·06	9·00	0·00	...	287·2	9·0	1·1	15	1·55	1·51
42·7	·274	3·2	0·5	86·4	537·5	1·00	1·75	16·00	11·75	0·50	...	306·9	8·7	1·9	25	5·04	4·89
47·0	·335	3·8	1·4	75·1	535·8	49·50	74·75	94·50	135·25	12·00	...	...	6·4	1·8	172	23·47	...

* 30 feet above the ground.

Appendix

COLCHESTER. Lat. 50° 53′ N.

Month.	Readings of the Barometer.			Temperature of the Air.							Mean Daily Readings of			
	Mean reduced and corrected to 32°.	Highest reduced and corrected to 32°.	Lowest reduced and corrected to 32°.	Highest during Month.	Lowest during Month.	Range during Month.	Mean				Maximum in Sun's rays.	Minimum on Grass.	Hygrometer.	
							Of all the highest.	Of all the lowest.	Daily Range.	Approximate Temperature.			Dry Bulb.	Wet Bulb.
January	29·751	30·165	28·879	52·2	22·4	29·8	41·9	29·2	12·7	35·5	57·1	26·1	38·0	36·7
February	29·917	30·372	29·062	60·5	25·6	34·9	50·0	34·4	15·6	42·2	71·5	30·0	45·8	42·5
March	29·775	30·436	28·878	61·4	26·4	35·0	52·9	34·4	18·5	43·6	84·7	30·2	47·3	43·6
April	29·752	30·260	28·715	72·0	29·4	42·6	58·2	37·1	21·1	47·1	93·9	32·5	52·7	48·1
May	29·794	30·181	29·317	66·8	34·5	51·3	70·7	44·7	26·0	57·7	108·8	39·0	64·5	58·3
June	29·905	30·155	29·465	85·6	40·0	45·6	74·8	48·6	26·2	61·7	117·8	44·8	68·4	61·6
July	29·806	30·207	29·401	92·1	41·4	50·7	80·4	53·6	26·8	67·0	124·1	50·0	73·7	65·4
August	29·664	30·085	29·012	87·3	42·4	44·9	75·7	53·6	22·1	64·6	114·3	49·6	70·0	62·8
September ...	29·651	30·173	29·052	89·0	41·0	48·0	71·3	49·2	22·1	60·2	105·7	43·8	65·9	59·7
October	29·757	30·221	29·178	65·5	26·3	39·2	57·3	38·2	19·1	47·7	85·7	33·6	52·3	49·0
November ...	29·811	30·438	28·990	58·4	24·4	34·0	67·6	34·4	33·2	51·0	59·4	31·1	43·4	41·5
December	29·372	30·090	28·604	57·0	24·5	32·5	50·4	37·0	13·4	43·7	58·0	32·6	46·3	44·3
Yearly Sums, Means, and Totals ...	29·746	30·232	29·046	72·2	31·5	40·7	62·6	41·2	21·4	51·9	90·0	36·9	55·7	51·1

DEVONPORT. Lat. 50° 17′ N.

January	29·747	30·257	28·839	56·0	19·5	36·5	46·8	33·2	13·6	40·0	68·1	27·0	42·3	40·5
February ...	30·023	30·442	29·342	61·0	22·6	38·4	53·0	36·2	16·8	44·6	88·0	35·0	46·7	44·3
March	29·870	30·395	28·933	61·0	28·0	33·0	56·5	37·5	19·0	47·0	99·1	32·1	49·9	46·5
April	29·783	30·273	28·992	67·7	24·2	43·5	60·8	36·8	24·0	48·8	110·6	29·7	53·9	49·6
May	29·813	30·174	29·270	80·0	31·7	48·3	69·4	44·4	25·0	56·9	118·9	38·0	61·8	56·7
June	29·964	30·136	29·419	83·8	36·1	47·7	76·0	48·0	28·0	62·0	121·4	42·9	66·0	60·3
July	29·844	30·123	29·457	90·0	45·5	44·5	81·0	54·0	27·0	67·5	125·6	46·6	72·9	65·0
August	29·694	30·110	29·149	84·5	42·5	42·0	75·3	52·3	21·0	62·8	108·2	41·0	66·2	61·6
September ...	29·390	30·092	28·937	85·5	42·9	42·6	71·6	49·7	21·9	60·6	103·7	37·2	65·0	60·0
October	29·779	30·231	29·359	68·9	30·8	38·6	62·1	40·8	21·3	51·4	97·6	31·7	54·5	51·5
November ...	29·784	30·424	28·770	58·8	26·8	32·0	51·7	36·0	15·7	43·8	76·7	27·4	46·5	44·2
December	29·301	30·012	28·603	56·8	33·7	23·1	53·5	40·8	12·7	47·1	70·4	30·9	49·7	48·2
Yearly Sums, Means, and Totals ...	29·749	30·222	29·089	71·2	32·0	39·2	63·0	42·5	20·5	52·7	99·0	35·0	56·4	52·4

DOVER. Lat. 51° 8′ N.

January	...	...	...	50·5	18·5	32·0	41·3	29·1	12·2	35·1	...	...	37·7	36·1
February	...	...	...	59·5	25·5	34·0	48·6	34·2	14·4	41·4	...	...	44·8	41·8
March	...	...	...	55·0	26·5	28·5	50·3	34·5	15·8	42·4	...	...	45·9	43·0
April	...	...	...	65·0	30·0	35·0	54·9	37·9	17·0	46·4	...	...	50·0	46·7
May	...	...	...	83·5	36·5	47·0	65·3	45·1	20·2	55·2	...	...	60·2	56·5
June	...	...	...	81·5	39·5	42·0	68·5	48·6	19·9	58·5	...	...	63·3	59·7
July	...	...	...	89·0	44·0	45·0	74·6	53·7	20·9	64·1	...	...	69·5	63·3
August	...	...	...	80·0	43·0	37·0	71·6	52·8	18·8	62·2	...	...	66·0	62·6
September ...	...	...	...	85·0	42·0	43·0	68·5	51·2	17·3	59·8	...	...	64·5	62·7
October	...	...	...	64·0	30·0	34·0	56·4	40·4	16·0	48·4	...	...	52·6	48·4
November ...	...	...	...	57·0	27·0	30·0	46·7	33·8	12·9	40·2	...	...	43·8	40·3
December	...	...	...	56·5	27·5	29·0	50·3	37·8	12·5	44·0	...	...	47·5	44·9
Yearly Sums, Means, and Totals ...	...	...	...	68·9	32·5	36·4	58·1	41·6	16·5	49·8	...	...	53·8	50·4

No. XXVII—*continued.*

Long. 0° 54′ E. Height above Sea 109 feet.

Hygrometrical Results from Glaisher's Tables.						Atmospherical Conditions.											
		In a Cubic Foot f Air.				Number of Days for mean Direction of Wind.					Calculated from Robinson's Anemometer.					Amount of Rain fall.	
Mean Temperature of Dew Point.	Mean elastic Force of Vapour.	Mean Weight of Vapour.	Mean additional Weight required for Saturation.	Mean Degree of Humidity.	Mean Weight of Cubic Foot of Air.	North.	East.	South.	West.	Number of calm, or nearly calm, Days.	Mean daily pressure of Wind.	Mean daily Horizontal Movement of the Air.	Amount of Cloud 0—10.	Ozone Scale 0—10.	Number of Days on which Rain fell.	On the Ground.	30 Feet above the.
											lbs. per sq. foot	Miles				Inches	Inches
34·9	·202	2·3	0·4	88·6	553·9	7·25	5·75	6·75	10·75	0·50	...	184·8	9·0	3·0	14	2·52	2·41
38·7	·237	2·7	0·8	76·7	548·2	3·00	0·50	9·00	16·50	0·00	...	213·8	7·5	4·0	6	0·67	0·63
39·4	·242	2·8	0·9	75·1	543·8	6·75	2·00	7·25	15·00	0·00	...	219·9	7·5	5·0	15	1·69	1·58
43·5	·282	3·2	1·3	71·1	537·6	8·00	7·25	7·25	7·50	0·00	...	199·9	7·6	4·6	13	1·24	1·14
53·1	·405	4·5	2·2	66·5	525·3	1·75	9·75	12·25	7·25	0·00	...	176·6	5·0	5·5	4	1·39	1·31
56·3	·453	5·0	2·6	64·8	523·1	7·00	5·50	6·75	10·75	0·00	...	170·5	5·5	6·0	4	0·53	0·48
59·3	·507	5·5	3·5	61·5	515·8	10·75	8·50	5·25	6·50	0·00	...	178·8	4·7	6·2	2	0·18	0·15
57·2	·470	5·1	2·9	64·2	517·1	4·25	5·50	10·50	10·75	0·00	...	198·5	7·2	5·9	10	2·03	1·82
54·6	·428	4·7	2·2	67·9	521·3	5·50	9·75	9·50	5·25	0·00	...	187·2	6·5	4·9	8	1·25	1·15
45·6	·307	3·5	1·0	78·5	537·9	8·25	4·50	6·00	12·25	0·00	...	186·7	6·6	2·8	12	2·35	2·17
39·2	·240	2·7	0·5	85·2	548·8	10·25	6·50	5·00	8·25	0·00	...	184·3	8·1	1·6	12	1·17	0·98
42·0	·268	3 1	0·5	86·0	537·5	1·25	3·00	14·25	12·50	0·00	...	204·7	8·2	1·8	25	3·78	3·33
47·0	·337	3·8	1·6	73·8	534·2	74·00	68·50	99·75	123·25	0·50	...	192·1	6·9	4·3	125	18·80	17·15

Long. 4° 5′ W. Height above Sea 35 feet.

																	*
38·3	·232	2·7	0·4	86·4	548·8	7·50	6·00	6·75	10·25	0·50	...	256·9	8·0	2·5	22	4·67	4·47
41·6	·263	3·0	0·6	83·2	549·0	5·50	0·00	7·75	12·75	3·00	...	226·2	8·0	3·0	19	1·52	1·41
42·9	·277	3·1	0·9	77·1	542·7	5·00	1·50	8·25	15·25	1·00	...	241·2	7·0	3·5	23	2·89	2·71
45·4	·303	3·4	1·2	73·1	536·7	7·25	4·50	9·00	8·25	1·00	...	257·3	6·1	3·8	8	2·03	1·84
52·3	·393	4·3	1·8	71·5	528·4	3·75	7·75	11·00	7·00	1·50	...	307·9	5·5	4·0	10	1·86	1·68
55·0	·433	4·8	2·5	66·9	525·8	7·75	4·75	9·00	8·00	0·50	...	175·7	6·0	4·5	6	0·62	0·56
59·1	·503	5·4	3·3	61·4	517·3	8·00	6·50	7·75	7·75	1·00	...	179·5	5·5	4·5	6	0·52	0·45
57·9	·481	5·3	1·7	75·2	521·4	6·50	4·75	9·50	10·25	0·00	...	264·3	6·7	5·1	16	3·85	3·67
53·9	·447	4·9	1·9	73·0	517·5	2·00	12·25	11·50	3·25	0·00	...	290·3	5·1	5·4	10	4·78	4·61
48·6	·341	3·9	0·9	80·0	535·6	7·25	5·25	7·00	11·50	0·00	...	226·4	6·5	5·8	22	4·90	4·62
41·6	·263	3·0	0·6	83·9	544·8	9·00	8·75	3·25	8·00	1·00	...	292·1	7·5	4·6	13	3·64	3·49
46·6	·318	3·6	0·4	89·5	532·2	1·25	3·50	12·75	13·50	0·00	...	459·1	8·0	4·8	30	8·62	7·75
48·8	·354	3·9	1·3	76·7	533·3	70·75	65·50	103·50	115·75	9·50	...	264·7	6·7	4·3	185	39·90	37·28

Long. 1° 19′ E. Height above Sea 325 feet.

39·9	·195	2·2	0·4	86·3	...	6·50	6·75	8·00	9·75	0·00	...	...	7·9	6·0	15	3·67	...
28·3	·232	2·7	0·7	77·8	...	7·25	0·50	6·50	14·75	0·00	...	...	5·3	5·5	14	1·08	...
39·7	·245	2·8	0·8	79·6	...	10·75	3·00	5·50	11·75	0·00	...	...	5·1	6·0	23	1·10	...
43·2	·280	3·2	0·9	78·2	...	7·25	8·00	6·75	8·00	0·00	...	...	5·7	6·1	23	1·04	...
53·3	·406	4·5	1·3	78·0	...	2·50	8·50	9·50	9·50	1·00	...	...	3·7	6·1	7	2·08	...
54·8	·431	4·8	1·7	74·3	...	3·00	6·25	11·00	9·75	0·00	...	...	3·6	5·1	8	0·68	...
58·5	·499	5·5	2·5	67·5	...	8·25	9·50	6·50	6·25	0·50	...	...	3·7	5·7	6	0·91	...
59·9	·516	5·7	1·3	81·0	...	5·25	7·25	9·25	9·25	0·00	...	...	5·3	5·8	12	4·04	...
61·2	·542	6·0	0·7	89·7	...	5·25	9·25	7·50	6·50	1·50	...	...	4·1	5·5	8	1·85	...
44·1	·290	3·3	1·2	73·4	...	7·25	6·25	4·50	12·50	0·50	...	...	5·3	4·3	12	2·28	...
36·2	·213	2·5	0·8	74·2	...	9·75	8·25	4·50	7·50	0·00	...	...	7·1	4·1	14	2·23	...
42·1	·268	3·1	0.6	82·3	...	2·25	2·00	10·75	16·00	0·00	...	...	7·5	4·0	22	5·21	...
46·3	·343	3·9	1·1	78·5	...	75·25	75·50	90·25	121·50	3·50	...	...	5·4	5·3	164	27·07	...

* 25 feet above the ground.

Appendix

GUERNSEY. Lat. 49° 33′ N.

Month.	Readings of the Barometer.			Temperature of the Air.							Mean Daily Readings of			
	Mean reduced and corrected to 32°.	Highest reduced and corrected to 32°.	Lowest reduced and corrected to 32°.	Highest during Month.	Lowest during Month.	Range during Month.	Mean				Maximum in Sun's rays.	Minimum on Grass.	Hygrometer.	
							Of all the highest.	Of all the lowest.	Daily Range.	Approximate Temperature.			Dry Bulb.	Wet Bulb.
January	29·709	30·239	28·683	53·0	25·0	28·0	45·6	34·9	10·7	40·2	60·7	33·0	42·0	40·2
February	30·003	30·423	29·409	55·5	31·5	24·0	50·6	38·1	12·5	44·3	91·4	35·1	46·2	43·8
March	29·839	30·287	29·020	58·0	33·0	25·0	52·2	38·3	13·9	45·2	103·2	35·5	47·6	45·2
April	29·624	30·105	29·156	68·0	34·0	34·0	56·7	42·4	14·3	49·5	94·7	39·2	51·4	49·1
May	29·713	30·109	29·184	66·5	35·0	31·5	59·3	42·8	16·5	51·0	104·7	39·9	53·8	50·6
June	29·953	30·238	29·027	81·0	46·0	35·0	68·6	51·0	17·6	59·8	111·0	46·4	61·7	57·8
July	29·735	30·132	29·307	82·0	47·0	35·0	69·0	52·1	16·9	60·5	108·2	50·6	65·1	61·1
August...	29·694	30·152	29·321	72·0	38·5	33·5	66·4	46·4	20·0	56·4	104·8	43·9	62·2	59·9
September	29·553	30·012	29·032	79·0	41·0	38·0	69·3	50·6	18·7	59·9	98·7	41·7	62 3	59·0
October	29·742	30·182	28·988	65·0	36·0	29·0	59·1	42·7	16·4	50·9	84·0	33·4	54·6	51·7
November	29·722	30·283	28. 961	59·0	27·0	32·0	52·0	35·4	16·6	43·7	67·4	25·2	47·0	44·5
December	29·189	30·163	28·937	58·0	31·0	27·0	54·6	38·5	16·1	46·5	63·6	29·4	49·4	47·7
Yearly Sums, Means, and Totals ...	29·706	30·194	29·185	66·4	35·4	31·0	58·6	42·8	15·8	50·7	91·0	37·8	53·6	50·9

JERSEY. Lat. 49° 11′ N.

January	...	...	...	58·0	20·0	38·0	46·1	34·0	12·1	40·0	...	...	41·3	40·2
February	...	...	...	57·0	34·0	23·0	53·4	38·2	15·2	45·8	...	...	46·5	45·1
March	...	...	...	66·0	36·0	30·0	58·7	44·1	14·6	51·4	...	...	49·4	48·0
April	...	...	...	74·0	41·0	33·0	67·2	45·7	21·5	56·4	...	...	56·8	55·2
May	...	...	...	84·0	30·0	54·0	70·9	45·7	25·2	58·3	...	...	60·6	55·5
June	...	...	...	85·0	42·0	43·0	74·5	49·4	25·1	61·9	...	...	63·8	59·2
July	...	...	...	91·0	48·0	43·0	80·1	55·0	25·1	67·5	...	...	67·8	64·5
August	...	...	...	92·0	47·0	45·0	75·2	55·4	19·8	65·3	...	...	65·4	61·9
September	...	...	...	90·0	40·0	50·0	75·0	54·1	20·9	64·5	...	...	66·6	62·1
October...	...	...	...	70·0	38·0	32·0	64·6	46·3	18·3	55·4	...	...	56·4	52·3
November	...	...	...	61·0	29·0	32·0	59·1	39·3	19·8	49·2	...	...	47·2	44·2
December	...	...	...	59·0	38·1	21·0	57·4	43·8	13·6	50·9	...	...	50·7	48·9
Yearly Sums, Means, and Totals ...	...	...	...	73·9	36·9	37·0	65·2	45·9	19·3	55·5	...	...	56·0	53·1

NETLEY. Lat. 50° 51′ N.

January	29·858	30·335	28·944	52·0	21·0	31·0	43·4	33·2	10·2	38·3	58·7	30·2	39·1	37·8
February	30·117	30·553	29·355	59·4	24·8	34·6	50·6	37·9	12·7	44·2	81·4	34·2	45·2	42·8
March	29·960	30·553	29·144	62·5	24·0	38·5	53·9	37·3	16·6	45·6	86·2	34·8	47·5	44·3
April	29·904	30·331	28·937	69·0	24·0	45·0	60·2	39·4	20·8	49·8	102·1	36·8	52·9	48·3
May	29·956	30·303	29·498	88·3	34·0	54·3	69·0	46·7	22·3	57·8	109·0	44·9	62·1	57·0
June	30·095	30·275	29·631	86·0	41·2	44·8	75·9	48·8	27·1	62·3	118·9	47·2	67·9	59·7
July	29·998	30·326	29·673	88·5	44·3	44·2	81·4	54·7	26·7	68·0	123·6	53·2	72·6	62·7
August	29·852	30·230	29·198	85·0	42·0	43·0	72·1	55·0	17·1	63·5	109·6	52·6	66·5	60·5
September	29·802	30·167	29·128	83·6	40·0	43·6	71·1	49·6	21·5	60·3	109·5	47·4	64·8	59·0
October...	29·916	30·375	29·364	66·0	26·8	39·2	58·4	40·6	17·8	49·5	88·3	38·6	52·3	49·1
November	29·950	30·577	29·078	58·0	23·8	34·2	48·1	35·2	12·9	41·6	65·4	32·6	44·2	41·7
December	29·493	30·170	28·704	57·0	33·6	23·4	52·1	42·3	9·8	47·2	64·1	39·4	47·8	46·3
Yearly Sums, Means, and Totals ...	29·908	30·350	29·221	71·3	31·6	39·7	61·3	43·4	17·9	52·3	93·1	41·0	55·2	50·8

No. XXVII—*continued.*

Long. 2° 40′ W. Height above Sea 248 feet.

Hygrometrical Results from Glaisher's Tables.						Atmospherical Conditions.											
		In a Cubic Foot of Air.				Number of Days for mean Direction of Wind.					Calculated from Robinson's Anemometer.					Amount of Rain fall.	
Mean Temperature of Dew Point.	Mean elastic Force of Vapour.	Mean Weight of Vapour.	Mean additional Weight required for Saturation.	Mean Degree of Humidity.	Mean Weight of Cubic Foot of Air.	North.	East.	South.	West.	Number of calm, or nearly calm, Days.	Mean daily pressure of Wind.	Mean daily Horizontal Movement of the Air.	Amount of Cloud 0—10.	Ozone Scale 0—10.	Number of Days on which Rain fell.	On the Ground.	25 Feet above the Ground.
											lbs. per sq. foot	Miles				Inches	Inches
38·0	·229	2·6	0·5	86·4	548·5	9·00	8·00	5·50	8·50	0·00	...	537·2	8·5	6·4	20	2·59	2·42
41·1	·258	3·0	0·6	83·4	549·1	12·25	1·00	6·00	9·75	0·00	...	434·1	6·8	6·5	14	0·73	0·62
42·5	·272	3·1	0·6	83·8	544·4	12·00	5·75	3·50	9·75	0·00	...	482·1	7·2	6·4	21	1·59	1·42
46·7	·321	3·6	0.7	84·3	536·4	7·50	5·25	7·50	9·75	0·00	...	382·8	6·3	6·1	14	2·31	2·17
47·5	·327	3·7	0·9	78·8	535·3	5·50	6·50	10·00	9·00	0·00	...	391·1	4·0	5·0	8	0·14	0·13
54·4	·425	4·7	1·4	77·5	530·7	7·75	6·75	6·25	7·25	2·00	...	300·6	5·0	5·0	3	0·33	0·29
57·8	·480	5·3	1·5	78 0	523·1	13·75	8·75	0·00	7·50	1·00	...	353·7	5·3	3·3	7	0·05	0·04
57·9	·481	5·3	0·9	86·4	525·3	2·50	3·50	9·25	15·75	0·00	...	284·7	6·9	5·3	15	0·31	0·28
56·1	·452	5·0	1·2	80·5	523·0	1·25	16·25	6·25	6·25	0·00	...	473·0	5·5	5·0	11	0·17	0·14
48·9	·345	3·9	0·9	80·6	534·8	3·75	6·75	3·25	16·25	1·00	...	317·0	7·3	5·4	22	3·21	2·75
41·7	·264	3·0	0·7	82·5	543·1	2·50	17·00	3·00	7·50	0·00	...	478·3	8·5	6·3	17	0·19	0·16
45·9	·310	3·6	0·5	88·5	530·4	9·00	5·50	10·50	6·00	0·00	...	556·9	8·2	5·2	29	0·60	0·54
48·2	·347	3·9	0·9	82·6	534·5	86·75	91·00	71·00	113·25	4·00	...	416·0	6·6	5·5	181	12·22	10·96

Long. 2° 6′ W. Height above Sea 72½ feet.

38·8	·236	2·7	0·3	91·5	...	4·50	8·50	11·00	6·50	0·50	...	...	8·9	4·9	12	3·22	...
43·5	·283	3·2	0·4	90·2	...	3·25	5·75	0·00	20·00	0·00	...	...	6·8	5·1	7	2·26	...
46·5	·317	3·6	0·4	90·2	...	4·00	12·75	7·75	6·50	0·00	...	...	4·8	5·3	9	1·55	...
53·8	·414	4·6	0·6	89·6	...	7·00	11·75	5·75	5·50	0·00	...	...	5·9	4·8	9	3·25	...
51·1	·375	4·2	1·7	70·5	...	4·00	8·75	12·00	5·75	0·50	...	...	4·8	5·7	9	2·53	...
55·3	·439	4·9	1·7	74·8	...	3·25	4·50	9·25	9·00	4·00	...	...	3·8	5·6	4	0·39	...
61·8	·555	6·0	1·4	81·5	...	11·25	10·50	4·25	3·00	2·00	...	...	4·2	5·9	5	0·20	...
59·0	·501	5·5	1·4	80·5	...	10·00	2·50	6·50	10·00	2·00	...	...	5·1	6·1	16	2·55	...
58·5	·491	5·4	1·8	75·5	...	2·50	6·25	14·75	3·50	3·00	...	...	4·0	6·0	9	1·25	...
48·5	·242	3·8	1·2	74·8	...	12·00	4·25	4·50	8·75	1·50	...	...	5·9	5·3	22	3·76	...
40·8	·255	2·9	0·8	79·2	...	6·75	9·75	3·00	6·50	4·00	...	...	6·9	5·2	18	1·70	...
47·0	·324	3·7	0·5	88·1	...	2·50	2·00	12·50	14·00	0·00	...	...	8·2	5·2	27	3·72	...
50·4	·378	4·2	1·0	82·2	...	71·00	87·25	91·25	99·00	17·50	...	...	5·8	5·4	147	26·38	...

Long. 1° 20′ W. Height above Sea 47 feet.

																	*
36·1	·213	2·4	0·4	89·6	554·5	7·50	6·00	5·00	12·50	0·00	...	154·1	8·4	5·3	18	3·36	2·07
40·0	·247	2·8	0·6	82·4	552·3	3·75	0·25	4·25	20·75	0·00	...	292·8	7·5	6·1	10	0·95	0·65
40·7	·254	2·9	0·8	78·1	547·1	6·75	1·50	6·25	16·50	0·00	...	329·8	7·4	5·1	17	1·93	1·31
43·7	·285	3·3	1·3	71·3	540·0	8·75	3·00	8·00	10·25	0·00	...	264·4	6·7	4·6	12	2·65	2·09
52·6	·398	4·4	1·8	71·5	530·6	3·25	4·00	15·00	8·75	0·00	...	112·0	5·8	5·1	9	1·45	0·82
53·2	·407	4·4	3·0	59·2	527·2	4·00	3·50	7·75	14·75	0·00	...	182·6	5·0	5·0	2	0·46	0·38
55·3	·439	4·8	3·8	54·3	520·6	8·75	5·25	6·75	9·25	1·00	...	194·8	4·8	4·6	7	1·36	1·10
55·7	·443	4·9	2·2	68·5	524·1	3·75	4·75	9·75	12·75	0·00	...	253·6	7·8	5·3	15	5·08	4·38
54·1	·420	4·6	2·1	68·8	525·2	5·75	7·25	11·25	4·25	1·50	...	248·3	4·9	5·1	12	3·95	3·31
45·8	·309	3·5	0·9	79·1	540·8	6·50	4·25	5·00	15·25	1·00	...	237·8	6·5	5·5	12	2·56	1·77
38·7	·236	2·7	0·6	80·7	550·6	12·50	6·75	3·50	7·25	0·00	..	272·9	7·9	4·6	7	1·41	1·09
44·6	·295	3·3	0·4	89·5	537·9	0·50	4·25	13·50	12·75	0·00	...	357·2	8·2	5·7	28	7·10	5·32
46·7	·329	3·7	1·5	74·4	537·6	71·75	49·75	96·00	145·00	3·50	...	241·7	6·7	5·2	149	32·26	24·29

* 23 feet above the ground.

Appendix

PARKHURST, ISLE OF WIGHT. Lat. 50° 45′ N.

Month.	Readings of the Barometer.			Temperature of the Air.							Mean Daily Readings of			
	Mean reduced and corrected to 32°.	Highest reduced and corrected to 32°.	Lowest reduced and corrected to 32°.	Highest during Month.	Lowest during Month.	Range during Month.	Mean				Maximum in Sun's rays.	Minimum on Grass.	Hygromter.	
							Of all the highest.	Of all the lowest.	Daily Range.	Approximate Temperature.			Dry Bulb.	Wet Bulb.
January	...	...	...	51·0	22·0	29·0	43·3	32·2	11·1	37·7	49·8	23·1	40·2	38·2
February	...	...	...	59·0	24·0	35·0	50·9	35·9	15·0	43·4	67·1	27·0	46·7	43·9
March	...	...	...	60·0	26·0	34·0	53·1	35·6	17·5	44·3	75·7	28·0	48·5	45·3
April	...	...	...	68·0	27·0	41·0	58·9	38·9	20·0	48·9	99·2	30·5	52·6	48·3
May	...	...	...	86·0	34·0	52·0	70·9	45·6	25·3	58·2	112·4	36·2	62·0	57·3
June	...	...	...	83·0	40·0	43·0	73·8	47·7	26·1	60·7	121·2	35·1	68·7	59·5
July	...	...	...	89·0	46·0	43·0	79·8	53·3	26·5	66·5	123·0	43·2	72·7	65·2
August	...	...	...	84·0	42·0	42·0	72·1	53·1	19·0	62·6	109·7	41·6	66·2	61·5
September	...	...	...	84·6	42·0	42·6	71·6	49·5	22·1	60·5	100·2	40·5	65·3	55·0
October...	...	...	...	68·6	12·0	56·6	60·1	39·8	20·3	49·9	71·7	34·1	54·0	50·7
November	...	...	...	61·0	24·0	37·0	48·6	35·1	13·5	41·8	59·3	26·1	44·5	42·2
December	...	...	...	61·0	32·0	29·0	53·8	41·9	11·9	47·8	59·4	32·1	49·6	47·4
Yearly Sums, Means, and Totals ...	...	...	...	71·3	31·0	40·3	61·4	42·4	19·0	51·9	87·4	33·1	55·9	51·2

PORTSMOUTH. Lat. 50° 45′ N.

January	29·932	30·414	29·025	53·4	22·2	31·2	43·5	31·3	12·2	37·4	53·9	25·9	39·7	38·1
February	30·180	30·615	29·419	60·4	26·4	34·0	50·9	37·5	13·4	44·2	73·3	30·9	46·0	42·9
March	30·029	30·607	29·221	61·0	27·6	33·4	52·6	37·2	15·4	44·9	83·4	31·4	48·0	43·8
April	29·974	30·400	29·001	67·0	29·4	37·6	59·0	40·2	18·8	49·6	96·1	34·2	52·7	47·5
May	30·006	30·343	29·583	82·8	37·0	45·8	67·0	47·4	19·6	57·2	108·3	40·4	61·1	55·5
June	30·151	30·370	29·702	83·2	43·6	39·6	74·6	50·7	23·9	62·6	118·9	43·8	67·3	59·5
July	30·055	30·384	29·733	89·0	49·0	40·0	81·2	56·0	25·2	68·6	125·3	50·3	71·9	63·8
August	29·895	30·311	28·922	83·2	35·0	48·2	72·2	54·9	17·3	63·5	108·6	50·5	65·9	60·4
September	29·839	30·324	29·223	81·4	44·6	36·8	70·9	51·7	19·2	61·3	106·5	46·1	64·8	58·5
October...	29·976	30·444	29·423	68·2	30·6	37·6	59·7	42·3	17·4	51·0	85·6	35·6	53·2	49·4
November	30·032	30·674	29·232	57·8	25·2	32·6	48·7	36·0	12·7	42·3	64·1	30·7	44·6	41·5
December	29·587	30·280	28·775	58·5	22·5	36·0	53·3	40·4	12·9	46·8	60·2	37·1	48·9	46·4
Yearly Sums, Means, and Totals ...	29·971	30·430	29·272	70·5	32·8	37·7	61·1	43·8	17·3	52·4	90·3	38·1	55·3	50·6

PRESTON. Lat. 50° 45′ N.

January	...	...	...	56·0	17·0	39·0	44·3	27·3	17·0	35·8	...	...	...	...
February	...	...	...	55·0	22·0	33·0	49·6	31·7	17·9	40·6	...	...	...	...
March	...	...	...	65·0	20·5	44·5	55·3	33·2	22·1	44·2	...	...	48·8	45·6
April	..	...	...	64·0	22·8	41·2	56·8	31·5	25·3	44·1	...	...	51·2	47·3
May	...	...	...	73·0	26·0	47·0	66·1	41·7	24·4	53·9	...	...	59·4	55·4
June	...	...	...	85·0	31·0	54·0	70·6	41·9	28·7	56·2	...	...	63·6	60·4
July	...	...	...	89·0	34·5	54·5	77·0	48·5	28·5	62·7	...	...	70·0	62·9
August	...	...	...	91·0	36·0	55·0	71·9	48·1	23·8	60·0	...	...	65·5	59·2
September	...	...	...	89·0	29·0	60·0	68·3	44·6	23·7	56·4	...	...	62·1	56·7
October	...	...	...	62·0	24·0	38·0	54·3	35·6	18·7	44·9	...	...	50·3	46·2
November	...	...	...	61·0	21·0	40·0	46·6	29·9	16·7	38·2	...	...	41·9	39·8
December	...	...	...	57·8	22·5	35·3	50·0	34·3	15·7	42·1	...	...	45·5	43·0
Yearly Sums, Means, and Totals ...	....	.....	....	70·6	25·5	45·1	59·2	37·3	21·9	48·2	...	...	55·8	51·6

No. XXVII—*continued.*

Long. 1° 16′ W. Height above Sea 200 feet.

Hygrometrical Results from Glaisher's Tables.						Atmospherical Conditions.											
Mean Temperature of Dew Point.	Mean elastic Force of Vapour.	In a Cubic Foot of Air.			Mean Weight of Cubic Foot of Air.	Number of Days for mean Direction of Wind.				Number of calm, or nearly calm, Days.	Calculated from Robinson's Anemometer.		Amount of Cloud 0—10.	Ozone Scale 0—10.	Number of Days on which Rain fell.	Amount of Rain fall.	
		Mean Weight of Vapour.	Mean additional Weight required for Saturation.	Mean Degree of Humidity.		North.	East.	South.	West.		Mean daily pressure of Wind.	Mean daily Horizontal Movement of the Air.				On the Ground.	Feet above the Ground.
											lbs. per sq. foot	Miles				Inches	Inches
35·6	·209	2·4	0·5	84·2	...	5·25	8·75	6·00	11·00	0·00	...	...	7·5	...	13	3·05	...
40·7	·255	3·0	0·7	81·1	...	2·75	0·75	10·75	13·75	1·00	...	...	5·8	5·4	8	0·96	...
41·8	·265	3·0	0·9	78·1	...	4·00	1·25	8·75	16·00	1·00	...	...	6·3	5·5	16	2·18	...
43·9	·288	3·3	1·2	72·8	...	6·00	7·50	5·50	10·50	0·50	...	...	5·6	6·1	10	2·49	...
53·3	·407	4·5	1·7	73·5	...	2·00	10·75	9·50	7·25	1·50	...	...	4·7	5·5	8	1·13	...
52·3	·393	4·3	3·4	55·2	...	7·25	5·00	7·00	9·25	1·50	...	...	4·4	5·7	3	0·74	...
59·6	·512	5·5	3·2	63·0	...	7·00	10·50	4·50	6·00	3·00	...	...	6·9	5·7	6	0·95	...
57·7	·477	5·3	1·8	74·7	...	4·25	9·50	7·50	8·25	1·50	...	...	7·0	4·9	16	4·98	...
46·6	·317	3·5	3·4	50·1	...	4·00	14·25	9·25	1·50	1·00	...	...	4·3	5·2	10	3·78	...
47·5	·327	3·7	1·0	78·2	...	6·50	5·00	4·25	12·75	2·50	...	...	5·8	4·7	13	3·42	...
39·5	·243	2·8	0·5	82·6	...	11·75	6·25	4·25	7·75	0·00	...	...	8·0	4·2	5	1·17	...
45·0	·300	3·4	0·6	85·2	...	1·25	1·75	12·75	14·75	0·50	...	...	7·7	4·1	26	7·91	...
47·0	·333	3·7	1·6	73·2	...	62·00	81·25	90·00	118·75	14·00	...	...	6·2	5·2	134	32·76	...

Long. 1° 5′ W. Height above Sea 20 feet.

																	*
36·0	·212	2·4	0·4	87·2	555·3	7·75	6·75	6·25	9·75	0·50	...	194·3	7·1	1·4	16	3·10	3·01
39·4	·242	2·8	0·8	78·4	552·8	2·75	5·25	0·25	20·25	0·50	...	177·5	6·4	1·1	9	0·60	0·56
39·2	·239	2·7	1·0	71·8	548·7	5·25	3·00	7·50	14·75	0·50	...	181·8	5·8	2·4	15	2·02	1·92
42·3	·270	3·1	1·4	68·0	541·7	7·75	5·00	8·00	9·25	0·00	...	159·4	5·2	3·7	11	2·53	2·47
50·7	·369	4·1	1·9	69·1	532·7	2·25	9·50	10·00	9·25	0·00	...	130·0	4·5	3·7	7	1·01	1·00
53·3	·407	4·5	2·9	60·8	528·9	3·75	5·00	5·00	15·25	1·00	...	107·3	2·9	3·7	3	0·45	0·42
57·7	·479	5·2	3·2	61·5	522·1	9·00	8·75	3·50	9·25	0·50	...	132·1	3·6	4·7	6	1·07	1·04
55·9	·448	5·0	2·0	70·5	525·4	3·25	7·50	6·75	12·00	1·50	...	154·2	6·7	4·1	17	4·14	3·92
53·2	·407	4·5	2·3	66·3	523·7	5·50	11·75	8·00	3·25	1·50	...	162·5	3·9	3·5	10	2·41	2·34
45·6	·306	3·4	1·1	75·4	540·8	6·25	3·25	5·00	15·50	1·00	...	140·0	5·8	0·5	16	3·03	2·93
37·9	·228	2·6	0·7	76·9	551·7	9·50	8·00	4·25	8·25	0·00	...	174·9	6·7	1·5	6	1·26	1·21
43·7	·286	3·2	0·7	82·5	538·4	1·00	5·75	12·75	11·50	0·00	...	213·6	7·1	1·8	27	6·57	6·57
46·2	·224	3·6	1·5	72·4	538·7	64·00	79·50	77·25	138·25	7·00	...	160·6	5·5	2·8	143	28·19	27·39

Long. 2° 40′ W. Height above Sea 220 feet.

...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·6	21	3·0	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·7	23	2·6	...
42·1	·270	3·1	0·9	78·4	...	...	...	...	...	...	...	...	...	2·5	25	3·9	...
43·2	·281	3·2	1·1	74·8	...	...	...	...	...	...	...	...	...	1·9	14	1·8	...
51·8	·386	4·3	1·3	76·4	...	...	...	...	...	...	...	...	...	1·8	15	2·3	...
57·7	·577	5·3	1·2	81·4	...	6·00	3·00	4·25	16·75	0·00	...	...	3	2·2	12	0·9	...
57·4	·473	5·2	2·8	64·6	...	2·25	9·50	5·75	13·50	0·00	...	...	3	3·2	9	0·6	...
54·0	·418	4·6	2·3	67·0	...	2·00	7·25	7·25	14·50	0·00	...	...	3	2·2	21	4·1	...
52·0	·390	4·3	1·9	70·1	...	8·75	11·25	6·00	4·00	0·00	...	...	3	...	13	1·6	...
41·9	·266	3·0	1·1	73·7	...	5·00	4·50	8·50	13·00	0·00	...	...	3	...	26	5·4	...
36·9	·322	2·5	0·5	84·2	...	10·50	7·00	1·75	8·25	2·50	...	...	3	1·0	14	2·7	...
40·1	·248	2·8	0·6	82·0	...	3·50	5·75	10·75	10·00	1·00	...	...	3	1·0	29	8·6	...
47·7	·363	3·8	1·4	75·3	...	38·00	48·25	44·25	80·00	3·50	...	...	3·0	1·4	222	37·5	...

* 20 feet above the ground.

Appendix

SHEERNESS. Lat. 51° 28′ N.

Month.	Readings of the Barometer.			Temperature of the Air.							Mean Daily Readings of			
	Mean reduced and corrected to 32°.	Highest reduced and corrected to 32°.	Lowest reduced and corrected to 32°.	Highest during Month.	Lowest during Month.	Range during Month.	Mean				Maximum in Sun's rays.	Minimum on Grass.	Hygrometer.	
							Of all the highest.	Of all the lowest.	Daily Range.	Approximate Temperature.			Dry Bulb.	Wet Bulb.
January	...	...	...	52·0	25·0	27·0	43·4	33·1	10·3	38·2	...	...	39·1	37·2
February	...	...	...	61·0	28·0	33·0	50·4	33·9	16·5	42·1	...	...	46·1	42·7
March	...	...	...	58·0	26·0	32·0	52·3	34·5	17·8	43·4	...	...	47·7	44·3
April	...	...	...	70·0	28·0	42·0	57·9	37·6	20·3	47·7	...	...	52·2	49·4
May	...	...	...	88·0	30·0	58·0	71·9	44·4	27·5	58·1	...	...	63·3	58·3
June	...	...	...	88·0	37·0	51·0	77·2	48·4	28·3	62·8	...	...	68·9	61·7
July	...	...	...	94·0	38·0	56·0	82·1	52·5	29·6	67·3	...	...	72·3	65·6
August... ...	...	...	...	86·0	35·0	51·0	75·4	47·8	27·6	61·6	...	...	69·3	64·8
September ...	...	...	...	84·6	37·0	47·0	69·5	46·8	22·7	58·1	...	...	64·1	61·2
October... ...	...	...	...	66·0	30·0	36·0	58·2	37·3	20·9	47·7	...	...	52·3	50·3
November ...	...	...	...	55·0	28·0	27·0	48·2	32·7	15·5	40·4	...	...	44·2	41·8
December ...	...	...	...	59·0	28·0	31·0	52·6	35·0	17·6	43·8	...	...	47·8	46·6
Yearly Sums, Means and Totals ...	...	...	...	71·7	30·8	40·9	61·6	40·3	21·3	50·9	...	...	55·6	52·0

SHORNCLIFFE CAMP. Lat. 51° 5′ N.

January	29·759	30·271	28·863	67·8	12·8	55·0	43·9	25·8	18·1	34·8	51·4	26·4	37·8	35·9
February	29·974	30·415	29·191	60·4	20·8	39·6	51·3	31·6	19·7	41·4	73·9	29·1	43·8	41·7
March	29·873	30·480	28·894	58·2	25·0	33·2	51·8	32·2	19·6	42·0	85·8	29·4	48·5	44·1
April	29·781	30·268	28·905	66·2	27·8	38·4	55·5	36·1	19·4	45·8	96·0	39·9	49·5	46·4
May	29·863	30·178	29·498	84·0	36·8	47·2	68·3	44·1	24·2	56·2	115·5	38·7	59·7	56·6
June	30·013	30·200	29·594	84·0	34·2	49·8	71·0	48·0	23·0	59·5	125·7	47·7	63·1	57·9
July	29·986	30·240	29·556	89·0	42·0	47·0	78·2	52·9	25·3	65·5	125·8	50·1	69·2	63·0
August... ...	29·777	30·185	29·199	83·0	40·2	42·8	73·1	52·0	21·1	62·5	105·1	50·9	66·4	62·0
September ...	29·720	30·520	29·183	86·6	43·0	43·6	70·3	49·9	20·4	60·1	114·5	46·5	64·3	59·6
October... ...	29·812	30·245	29·353	65·8	26·0	39·8	56·8	37·4	19·4	47·1	90·7	35·6	51·5	48·2
November ...	29·762	30·326	29·039	56·8	21·0	35·8	47·6	30·3	17·3	38·9	62·4	30·8	43·0	40·8
December ...	29·379	29·893	28·704	58·0	19·4	38·6	51·1	34·6	16·5	42·8	61·7	34·5	46·9	45·0
Yearly Sums, Means, and Totals ...	29·808	30·268	29·165	71·6	29·1	42·6	59·9	39·6	20·3	49·7	92·4	38·3	53·6	50·1

WALMER. Lat. 51° 0′ N.

January	...	...	...	52·8	24·8	28·0	44·3	31·8	12·5	38·0	...	...	39·8	38·0
February	...	...	...	60·8	27·8	33·0	51·3	36·4	14·9	43·8	...	...	46·3	43·9
March	...	...	...	60·8	27·0	33·8	53·0	36·2	16·8	44·6	...	...	48·8	45·3
April	...	...	...	68·0	28·8	39·2	58·7	38·1	20·6	48·4	...	...	53·5	49·5
May	...	...	...	82·0	32·8	49·2	69·7	45·3	24·4	57·5	...	...	63·0	57·3
June	...	...	...	85·0	41·2	43·8	73·1	49·1	24·0	61·1	...	...	67·2	62·3
July†	...	...	...	85·0	47·2	37·8	76·2	55·7	20·5	65·9	...	...	70·6	64·2
August... ...	...	...	...	85·8	41·6	44·2	74·7	53·8	20·9	64·2	...	...	68·9	64·6
September ...	...	...	...	79·0	41·5	37·5	70·6	52·2	18·4	61·4	...	...	65·2	60·6
October... ...	...	...	...	67·0	29·0	38·0	58·0	39·8	18·2	48·9	...	...	52·9	47·6
November ...	...	...	...	58·2	27·4	30·8	52·6	34·6	18·0	43·6	...	...	44·3	40·5
December ...	...	...	...	58·4	27·0	31·4	53·4	37·5	15·9	45·4	...	...	47·2	44·2
Yearly Sums, Means, and Totals ...	...	...	...	70·2	33·0	37·2	61·3	42·5	18·8	51·9	...	...	55·6	51·5

No. XXVII—*continued.*

Long. 0° 49′ E. Below the Sea Level 2 feet.

Hygrometrical Results from Glaisher's Tables.						Atmospherical Conditions.											
Mean Temperature of Dew Point.	Mean elastic Force of Vapour.	In a Cubic Foot of Air.			Mean Weight of Cubic Foot of Air.	Number of Days for mean Direction of Wind.				Number of calm, or nearly calm, Days.	Calculated from Robinson's Anemometer.		Amount of Cloud 0—10.	Ozone Scale 0—10.	Number of days on which Rain fell.	Amount of Rain fall.	
		Mean Weight of Vapour.	Mean additional Weight required for Saturation.	Mean degree of Humidity.		North.	East.	South.	West.		Mean daily pressure of Wind.	Mean daily Horizontal Movement of the Air.				*On the Ground.*	Feet above the Ground.
											lbs. per sq. foot	Miles.				Inches	Inches
34·7	·202	2·3	0·5	84·8	...	6·50	6·00	10·50	8·00	0·00	...	...	7·3	3·4	6	...	...
38·8	·237	2·7	0·9	76·6	...	2·50	0·25	10·25	16·00	0·00	...	...	5·0	3·2	4	...	...
40·5	·252	2·9	0·8	76·9	...	5·50	3·00	10·75	11·75	0·00	...	...	5·0	3·1	8	...	...
46·5	·318	3·6	0·9	81·4	...	9·25	7·75	5·75	7·25	0·00	...	...	5·9	3·2	8	...	...
54·1	·419	4·7	1·8	72·3	...	7·75	6·75	8·75	7·75	0·00	...	...	3·1	3·8	5	...	...
56·1	·450	5·0	2·8	63·2	...	9·75	5·25	5·25	8·75	1·00	...	...	3·1	4·1	3	...	...
60·6	·530	5·7	2·9	66·2	...	13·25	9·75	2·50	5·00	0·50	...	...	3·6	4·1	3	...	...
61·3	·540	5·9	1·9	75·8	...	5·50	5·00	10·00	9·50	1·00	...	...	6·9	4·0	9	...	...
58·8	·497	5·4	1·1	82·7	...	9·75	10·00	5·50	4·75	0·00	...	...	4·3	4·0	11	...	...
48·3	·339	3·8	0·6	86·3	...	6·75	3·75	9·50	11·00	0·00	...	...	4·1	3·3	4	...	...
38·9	·238	2·7	0·6	81·4	...	9·75	8·00	7·25	5·00	0·00	...	...	6·8	3·0	10	...	...
45·3	·302	3·4	0·3	91·6	...	1·75	4·25	14·00	11·00	0·00	...	...	5·6	3·7	15	...	...
48·7	·360	4·0	1·3	78·3	...	88·00	69·75	100·00	105·75	2·50	...	...	5·1	3·6	86	...	...

Long. 1° 10′ E. Height above Sea 220 feet.

																	*
33·3	·191	2·2	0·5	84·6	554·1	6·50	7·25	5·25	12·00	0·00	...	...	8·1	4·1	12	3·32	2·22
39·2	·241	2·7	0·5	84·0	551·3	2·00	0·25	4·00	22·75	0·00	...	...	6·1	4·2	8	0·75	0·48
39·3	·241	2·8	1·1	70·6	545·5	8·00	1·50	4·75	16·75	0·00	...	...	5·2	4·7	11	1·28	0·81
43·1	·279	3·2	0·9	78·8	541·5	7·75	8·00	4·75	8·50	1·00	...	...	5·9	4·0	11	1·39	1·28
53·9	·416	4·6	1·1	82·1	531·3	2·50	10·50	10·25	7·75	0·00	...	331·3	3·2	4·1	5	1·13	0·96
53·5	·410	4·5	1·8	71·1	530·9	5·75	4·25	12·50	6·50	1·00	...	250·4	3·3	4·4	6	0·92	0·61
58·2	·484	5·3	2·5	67·2	523·5	9·75	6·75	6·75	6·75	1·00	...	337·4	3·1	3·4	5	0·70	0·52
58·5	·490	5·4	1·7	76·0	522·5	2·75	4·50	9·75	13·00	1·00	...	327·2	4·7	4·2	12	4·17	2·93
55·7	·445	4·9	1·7	73·8	524·1	4·75	10·25	8·50	3·50	3·00	...	327·7	4·0	4·2	9	2·25	1·89
44·8	·298	3·4	0·9	78·2	539·8	9·00	3·50	3·50	13·50	1·50	...	244·5	5·1	3·7	15	2·49	1·58
38·1	·230	2·6	0·5	82·8	548·4	14·25	5·00	4·50	5·75	0·50	...	443·0	7·6	3·1	15	2·25	1·20
42·9	·276	3·1	0·6	86·7	536·8	1·50	1·75	12·75	15·00	0·00	...	630·6	7·6	4·5	24	5·63	2·99
46·7	·333	3·7	1·1	78·0	537·5	74·50	63·50	87·25	131·75	9·00	...	...	5·3	4·0	133	26·28	17·47

Long. 1° 2′ E. Height above Sea 14 feet.

35·7	·209	2·4	0·5	85·6	...	5·00	3·00	11·50	11·50	0·00	...	...	5·6	3·8	12	3·77	...
41·1	·259	3·0	0·6	83·5	...	3·25	1·00	7·75	17·00	0·00	...	...	4·6	4·2	4	1·24	...
41·5	·263	3·0	0·9	76·3	...	6·75	1·00	7·00	16·25	0·00	...	...	3·6	4·8	9	1·33	...
45·5	·305	3·4	1·1	74·5	...	8·25	2·75	7·25	11·75	0·00	...	...	4·4	3·9	7	1·46	...
52·5	·395	4·4	2·0	68·5	...	7·25	5·00	10·25	8·50	0·00	...	...	2·9	3·6	3	1·72	...
58·4	·490	5·3	2·0	73·5	...	10·75	4·00	7·25	7·50	0·50	...	...	2·8	3·8	5	0·87	...
59·3	·506	5·4	2·7	67·4	...	11·75	4·00	10·75	4·50	0·00	...	...	2·5	4·1	8	3·36	...
61·1	·540	5·8	1·9	76·5	...	3·75	3·25	12·25	11·75	0·00	...	...	3·6	4·7	10	3·41	...
56·8	·463	5·1	1·7	75·0	...	10·50	7·50	6·50	5·50	0·00	...	...	3·2	4·4	8	1·70	...
42·3	·270	3·1	1·4	67·5	...	3·50	8·00	9·00	10·50	0·00	...	...	3·8	4·7	11	3·02	...
36·1	·212	2·5	0·9	72·5	...	3·75	15·25	7·75	3·25	0 00	...	...	4·1	4·9	9	0·90	...
40·8	·255	2·9	0·8	79·2	...	3·00	4·50	10·50	13·00	0·00	...	...	4·7	3·2	26	4·35	...
47·6	·347	3·9	1·4	75·0	...	77·50	59·25	107·75	121·00	0·50	...	...	3·8	4·2	112	27·13	...

* 20 feet above the ground.

Appendix

WINCHESTER. Lat. 51° 4′ N.

Month.	Readings of the Barometer.			Temperature of the Air.							Mean Daily Readings of			
	Mean reduced and corrected to 32°.	Highest reduced and corrected to 32°.	Lowest reduced and corrected to 32°.	Highest during Month.	Lowest during Month.	Range during Month.	Mean				Maximum in Sun's rays.	Minimum on Grass.	Hygrometer.	
							Of all the highest.	Of all the lowest.	Daily Range.	Approximate Temperature.			Dry Bulb.	Wet Bulb.
January	...	...	...	54·0	19·0	35·0	43·0	30·0	13·0	36·5	...	...	38·3	37·0
February	...	...	...	60·0	23·0	37·0	50·8	34·0	16·8	42·4	...	...	45·1	43·0
March	...	...	...	62·0	24·0	38·0	53·3	34·0	19·3	43·6	...	...	47·2	44·2
April	...	...	...	69·0	23·0	46·0	59·5	36·7	22·8	48·1	...	...	53·0	48·9
May	...	...	...	85·0	32·0	53·0	69·0	43·6	25·4	56·3	...	...	62·7	57·1
June	...	...	...	83·5	38·5	45·0	75·3	45·4	29·9	60·3	...	...	68·3	62·1
July	...	...	...	93·0	42·5	50·5	81·6	51·4	30·2	66·5	...	...	72·3	63·2
August	...	...	...	89·5	37·5	52·0	73·1	50·4	22·7	61·7	...	...	66·8	60·7
September	...	...	...	88·0	27·5	60·5	72·3	37·6	34·7	54·9	...	...	64·7	58·9
October...	...	...	...	66·0	22·5	43·5	59·0	36·8	22·2	47·9	...	...	51·8	48·7
November	...	...	...	58·0	23·0	35·0	48·0	33·1	14·9	40·5	...	...	43·4	41·4
December	...	...	...	58·5	30·0	28·5	52·3	39·1	13·2	45·7	...	...	47·3	45·9
Yearly Sums, Means, and Totals ...	...	...	...	72·2	28·5	43·7	61·4	39·3	22·1	50·4	...	...	55·1	50·9

WOOLWICH. Lat. 51° 29′ N.

January	29·575	29·933	28·755	51·9	19·5	32·4	42·6	31·4	11·2	37·0	45·6	30·3	38·6	36·0
February	29·793	30·150	29·095	60·3	20·5	39·8	51·2	33·9	17·4	42·6	55·8	32·6	46·3	42·6
March	29·654	30·190	28·835	60·1	23·2	36·9	53·4	34·4	19·0	43·9	71·9	33·2	48·1	43·7
April	29·613	30·036	28·608	67·3	24·3	43·0	58·4	36·6	21·8	47·5	94·2	35·8	52·8	48·9
May	29·548	29·960	29·302	84·9	29·0	55·9	68·5	43·6	24·9	56·0	120·6	39·3	64·2	59·1
June	29·813	29·996	29·436	86·0	40·0	46·0	75·5	47·3	28·2	61·4	133·8	43·2	70·0	64·2
July	29·726	30·045	29·381	94·2	40·0	54·2	80·1	53·4	26·7	66·7	135·7	57·5	74·3	68·5
August	29·572	29·947	29·059	87·2	40·5	46·7	73·8	52·4	21·4	63·1	114·3	48·9	68·3	65·1
September	29·551	30·000	28·938	92·5	43·9	48·6	70·9	48·6	22·3	59·7	119·9	44·4	66·3	63·0
October...	29·644	30·027	29·347	69·0	24·6	44·4	57·3	36·7	20·6	47·0	89·4	34·4	52·6	50·5
November	29·654	30·231	28·871	55·7	21·2	34·5	48·1	32·4	15·7	40·2	56·5	30·8	43·9	41·8
December	29·216	29·826	28·462	58·3	26·3	32·0	51·3	37·2	14·1	44·2	55·8	50·1	47·5	45·4
Yearly Sums, Means, and Totals ...	29·613	30·028	29·007	72·3	29·4	42·9	60·9	40·6	20·3	50·8	91·1	40·0	56·1	52·4

ABERDEEN. Lat. 57° 9′ N.

January	29·658	30·379	28·628	56·0	21·0	35·0	44·8	32·3	12·5	38·5	...	...	38·6	36·6
February	29·655	30·304	28·396	61·0	25·0	36·0	49·2	34·5	14·7	41·8	...	...	42·6	39·3
March	29·631	30·474	28·538	62·0	27·0	35·0	51·0	34·7	16·3	42·8	...	...	44·7	40·5
April	29·772	30·336	28·739	63·0	29·0	34·0	53·7	37·9	15·8	45·8	...	...	47·5	43·7
May	29·860	30·260	29·013	70·0	29·0	41·0	60·5	42·5	18·0	51·5	102·1	47·2	53·8	48·8
June	29·930	30·360	29·482	79·0	40·0	39·0	72·1	46·0	26·1	59·0	113·0	50·3	60·2	52·6
July	29·991	30·464	29·477	86·0	43·0	43·0	73·0	50·5	22·5	61·7	112·0	50·0	60·8	56·1
August	29·746	30·741	29·106	83·0	42·0	41·0	68·7	50·6	18·1	59·6	103·0	50·5	60·3	55·8
September	29·842	30·430	28·974	77·0	37·0	40·0	61·0	46·8	14·2	53·9	92·0	...	55·2	51·7
October...	29·679	30·049	29·004	76·0	29·0	47·0	53·5	35·9	17·6	44·7	82·8	...	46·2	43·4
November	29·851	30·587	28·769	60·0	27·0	33·0	45·5	34·4	11·1	39·9	66·0	...	40·7	38·9
December	...	...	...	55·0	26·0	29·0	47·3	34·2	13·1	40·7	57·4	...	41·7	39·7
Yearly Sums, Means, and Total ...	29·783	30·399	28·920	69·0	31·2	37·8	56·7	40·0	16·7	48·3	...	...	49·4	45·6

No. XXVII—*continued.*

Long. 1° 20′ W. Height above Sea 214 feet.

Hygrometrical Results from Glaisher's Tables.						Atmospherical Conditions.											
Mean Temperature of Dew Point.	Mean elastic Force of Vapour.	In a Cubic Foot of Air.			Mean Weight of Cubic Foot of Air.	Number of Days for mean Direction of Wind.				Number of calm, or nearly calm, Days.	Calculated from Robinson's Anemometer.		Amount of Cloud 0—10.	Ozone Scale 0—10.	Number of days on which Rain fell.	Amount of Rain fall.	
		Mean Weight of Vapour.	Mean additional Weight required for Saturation.	Mean degree of Humidity.		North.	East.	South.	West.		Mean daily pressure of Wind.	Mean daily Horizontal Movement of the Air.				On the ground.	Feet above the Ground.
											lbs. per sq. foot	Miles				Inches	Inches
35·2	·205	2·4	0·4	88·9	...	8·00	7·25	8·00	7·75	0·00	...	...	6·8	2·7	18	4·05	...
40·6	·252	2·9	0·5	84·4	...	6·50	0·50	10·25	11·75	0·00	...	...	4·1	2·3	11	0·92	...
40·8	·255	2·9	0·8	79·2	...	8·25	2·75	9·50	10·50	0·00	...	...	3·8	1·6	20	3·03	...
44·8	·297	3·4	1·1	73·5	...	9·25	6·25	8·50	6·00	0·00	...	...	3·7	1·6	13	2·82	...
52·3	·393	4·3	2·0	69·0	...	3·00	8·75	13·50	5·75	0·00	...	...	3·5	2·8	6	1·33	...
57·2	·469	5·2	2·4	67·0	...	8·75	4·50	7·50	9·25	0·00	...	...	4·6	4·8	4	0·62	...
56·3	·456	5·0	3·5	56·9	...	10·00	9·00	4·75	7·25	0·00	...	...	4·6	4·4	6	1·02	...
55·9	·446	4·9	2·3	68·3	...	4·75	8·25	8·25	9·75	0·00	...	...	5·1	4·3	14	3·75	...
54·0	·420	4·6	2·1	68·7	...	5·50	12·75	8·00	3·75	0·00	...	...	4·7	3·9	11	3·73	...
45·6	·307	3·4	0·9	79·4	...	6·75	5·25	7·25	11·75	0·00	...	...	6·2	3·3	16	3·06	...
39·0	·238	2·7	0·5	84·4	...	11·50	8·75	4·50	5·25	0·00	...	...	7·0	2·5	6	1·85	...
44·3	·292	3·3	0·4	90·5	...	1·25	5·50	14·25	10·00	0·00	...	...	7·8	4·1	29	8·15	...
47·2	·336	3·7	1·4	75·8	...	83·50	79·50	104·25	98·75	0·00	...	...	5·2	3·2	154	34·33	...

Long. 0° 4′ E. Height above Sea 145 feet.

																	*
32·5	·185	2·3	0·6	79·4	550·0	10·50	2·25	3·75	14·50	0·00	...	156·9	7·2	3·2	15	4·33	4·04
38·4	·233	2·7	0·9	74·8	545·4	2·75	0·00	3·00	23·25	0·00	...	138·9	4·5	3·3	11	0·88	0·62
39·0	·236	2·7	1·1	70·7	541·8	3·00	0·75	2·75	24·50	0·00	...	193·0	4·1	2·7	13	2·09	1·90
45·0	·300	3·4	1·2	75·4	534·9	7·25	4·25	6·75	11·75	0·00	...	219·0	5·3	3·6	10	1·48	1·45
54·7	·431	4·8	1·8	71·7	521·1	0·75	8·25	3·00	19·00	0·00	...	125·8	4·3	4·7	5	1·39	1·32
59·7	·514	5·6	2·4	69·8	519·5	3·50	0·25	3·50	22·75	0·00	...	100·5	3·8	3·3	2	0·31	0·28
64·2	·602	6·5	2·6	70·8	513·4	4·75	5·75	11·00	9·50	0·00	...	122·7	3·5	2·5	4	1·25	1·15
62·5	·567	6·2	1·4	82·0	516·7	0·50	2·25	8·50	19·75	0·00	...	167·5	4·2	4·1	13	2·54	2·20
60·3	·524	5·7	1·3	81·5	518·6	1·25	10·50	5·00	13·25	0·00	...	144·6	4·2	2·9	9	1·16	1·00
48·4	·341	3·8	0·6	85·9	535·3	6·75	1·00	0·75	22·50	0·00	...	135·1	4·4	3·0	11	2·67	2·39
39·4	·242	2·8	0·5	84·1	545·2	4·00	0·25	2·00	23·75	0·00	...	144·8	5·2	1·9	12	0·85	0·71
43·1	·278	3·2	0·6	85·8	533·2	1·00	0·50	9·75	19·75	0·00	...	197·8	6·2	3·8	23	4·63	3·97
48·9	·371	4·1	1·2	77·7	531·3	46·00	36·00	59·75	224·25	0·00	...	153·9	4·7	3·2	128	23·58	21·03

Long. 2° 6′ W. Height above Sea 61 feet.

																	†
33·9	·195	2·2	0·5	84·2	551·5	5·50	5·25	12·25	8·00	0·00	...	187·0	7·5	...	17	2·55	2·26
35·3	·206	2·4	0·7	75·9	546·9	3·00	0·25	13·50	12·25	0·00	...	175·0	6·0	...	12	1·56	1·51
35·6	·209	2·4	0·9	70·5	544·3	2·00	1·75	16·50	10·75	0·00	...	162·0	6·0	...	15	1·69	1·58
39·5	·242	2·8	1·0	74·7	543·6	6·50	5·75	9·00	8·75	0·00	...	198·0	6·5	...	20	2·47	2·30
43·9	·286	3·2	1·4	69·0	538·3	3·25	3·50	19·75	4·50	0·00	...	215·0	5·3	...	12	1·36	1·31
45·9	·310	3·4	2·4	59·6	533·7	1·50	4·00	16·00	8·50	0·00	...	187·0	7·0	2·0	9	0·74	0·71
52·0	·388	4·3	1·6	72·6	532·7	7·00	4·75	16·00	3·25	0·00	...	164·0	4·6	1·7	9	0·75	0·71
41·9	·386	4·3	1·5	73·5	528·8	4·00	3·25	13·75	10·00	0·00	...	161·0	5·4	1·6	14	6·88	4·88
48·3	·340	3·8	1·1	78·2	536·1	14·50	4·50	6·50	4·50	0·00	...	159·0	6·3	1·7	14	4·12	3·59
40·2	·250	2·9	0·7	80·6	543·2	6·50	2·25	13·75	8·50	0·00	...	147·0	5·7	0·5	13	1·63	1·42
36·6	·217	2·5	0·4	86·3	552·6	11·75	1·25	9·75	7·25	0·00	...	161·0	7·8	0·3	14	0·76	0·64
37·2	·223	2·6	0·5	85·4	...	5·00	3·25	16·25	6·50	0·00	...	201·2	6·7	0·8	19	3·63	2·80
41·7	·271	3·1	1·1	75·9	541·1	70·50	39·75	163·00	92·75	0·00	...	176·4	6·2	...	168	28·14	23·71

* 20 feet above the ground. † 27 feet above the ground.

Appendix

EDINBURGH CASTLE. Lat. 55° 57′ N.

Month.	Readings of the Barometer.			Temperature of the Air.							Mean Daily Readings of			
	Mean reduced and corrected to 32°.	Highest reduced and corrected to 32°.	Lowest reduced and corrected to 32°.	Highest during Month.	Lowest during Month.	Range during Month.	Mean				Maximum in Sun's rays.	Maximum on Grass.	Hygrometer.	
							Of all the highest.	Of all the lowest.	Daily Range.	Approximate Temperature.			Dry Bulb.	Wet Bulb.
January	29·296	29·965	27·948	55·0	25·5	29·5	44·2	32·7	11·5	38·4	49·7	26·4	39·6	37·4
February	29·299	30·058	28·110	55·0	26·0	29·0	47·0	34·3	12·7	40·6	55·9	29·1	42·7	40·2
March	29·281	30·086	28·276	58·5	27·0	31·5	50·4	36·6	13·8	43·5	76·7	29·4	46·0	42·8
April	29·410	29·919	28·367	64·0	32·0	32·0	54·1	40·3	13·8	47·2	85·8	31·0	49·6	45·6
May	29·368	29·865	28·684	70·0	32·0	38·0	60·4	44·6	15·8	52·5	98·8	35·0	55·6	50·4
June	29·507	29·896	29·095	74·5	44·0	30·5	65·9	48·1	17·8	57·0	99·4	40·5	59·8	54·7
July	29·532	30·109	28·996	84·0	42·2	41·8	71·4	52·6	18·8	62·0	102·9	46·2	65·6	59·1
August	29·271	29·870	28·791	86·0	45·2	40·8	67·5	52·0	15·5	59·7	99·8	46·1	62·8	58·5
September	29·367	30·002	28·417	81·0	42·0	39·0	63·0	48·3	14·7	55·7	82·8	42·0	57·7	53·5
October	29·252	29·672	28·262	64·0	30·5	33·5	54·2	38·8	15·4	46·5	71·3	32·3	48·6	45·3
November	29·423	30·199	28·387	63·0	25·0	38·0	43·9	34·3	9·6	39·1	50·8	26·9	40·5	37·9
December	28·728	29·671	28·223	59·0	26·0	33·0	47·8	35·8	12·0	41·8	50·3	28·8	43·1	40·7
Yearly Sums, Means, and Totals ...	29·311	29·943	29·463	67·8	33·1	34·7	55·8	41·5	14·3	48·6	77·0	34·5	51·0	47·2

ATHLONE. Lat. 53° 26′ N.

January	...	...	...	55·0	20·0	35.0	45·1	31·0	14·1	38·0	...	...	40·5	39·5
February	...	...	...	60·0	20·0	40.0	46·2	30·4	15·8	38·3	...	...	41·0	39·5
March	...	...	...	62·0	28·0	34·0	54·2	37·3	16·9	45·7	...	...	49·5	46·5
April	...	...	...	67·0	31·0	36·0	59·5	37·9	21·6	48·7	...	...	53·0	49·0
May	...	...	...	71·0	30·0	41·0	64·3	42·1	22·2	53·2	...	...	58·0	53·5
June	...	...	...	81·5	38·0	43·5	70·3	44·8	25·5	57·5	...	...	63·0	60·0
July	...	...	...	82·0	40·0	42·0	73·7	46·1	27·6	59·9	...	...	65·6	60·3
August	...	...	...	80·3	39·0	41·3	69·4	47·7	21·7	58·5	...	...	62·9	57·6
September	...	...	...	80·0	38·0	42·0	66·2	46·5	19·7	56·3	...	...	60·3	56·2
October...	...	...	...	61·5	26·5	35·5	55·7	36·6	19·1	46·1	...	...	50·1	47·1
November	...	...	...	61·0	24·0	37·0	48·6	32·8	15·8	40·7	...	...	42·6	40·9
December	...	...	...	57·0	26·5	30·5	49·3	35·3	14·0	42·3	...	...	44·1	42·4
Yearly Sums, Means, and Totals ...	...	...	...	68·2	30·1	38·1	58·5	39·0	19·5	48·7	...	...	52·5	49·3

BELFAST. Lat. 54° 36′ N.

January	29·381	30·299	28·454	55·2	27·2	28·0	46·5	34·6	11·9	40·5	52·6	27·1	41·7	39·8
February	29·888	30·516	28·668	55·8	30·5	25·3	49·4	37·5	11·9	43·4	62·2	29·5	44·6	42·3
March	29·724	30·514	28·711	61·2	31·6	29·6	53·2	37·8	15·4	45·5	76·2	25·5	46·4	44·2
April	29·813	30·388	28·778	67·2	28·8	38·4	58·6	40·2	18·4	49·4	98·5	30·2	52·7	47·4
May	29·522	30·167	29·067	70·2	35·1	35·1	63·8	44·1	19·7	53·9	99·5	33·5	57·1	50·9
June	30·020	30·333	29·529	79·2	43·1	36·1	69·1	49·1	20·0	59·1	109·3	38·5	62·5	55·1
July	30·000	30·447	29·489	85·2	42·4	42·8	75·3	53·3	22·0	64·3	110·1	45·6	67·6	59·3
August...	29·744	30·189	29·174	86·1	41·2	44·9	73·4	51·1	22·3	62·2	104·3	49·3	64·3	58·0
September	29·768	30·336	28·860	79·0	39·0	40·0	67·8	48·9	18·9	58·3	90·2	45·2	59·0	54·8
October	29·679	30·076	28·923	64·0	31·3	32·7	57·8	39·0	18·8	48·4	74·1	34·5	49·4	46·0
November	29·838	30·600	28·832	62·0	28·2	33·8	52·4	36·3	16·1	44·3	56·3	31·7	42·2	40·9
December	29·219	30·071	28·437	58·7	28·0	30·7	53·3	37·5	15·8	45·4	55·2	33·3	44·7	42·9
Yearly Sums, Means, and Totals ...	29·716	30·328	28·910	68·6	33·9	34·7	60·0	42·4	17·6	51·2	82·4	35·3	52·7	48·5

No. XXVII—*continued*.

Long. 3° 11′ W. Height above Sea 402 feet.

Hygrometrical Results from Glaisher's Tables.						Atmospherical Condition.											
		In a Cubic Foot of Air.				Number of Days for mean Direction of Wind.					Calculated from Robinson's Anemometer.					Amount of Rain fall.	
Mean Temperature of Dew Point.	Mean elastic Force of Vapour.	Mean Weight of Vapour.	Mean additional Weight required for Saturation.	Mean Degree of Humidity.	Mean Weight of Cubic Foot of Air.	North.	East.	South.	West.	Number of calm, or nearly calm, Days.	Mean daily pressure of Wind.	Mean daily Horizontal Movement of the Air.	Amount of Cloud 0—10.	Ozone Scale 0—10.	Number of Days on which Rain fell.	On the Ground.	20 Feet above the Ground.
											lbs. per sq. foot.	Miles.				Inches.	Inches.
34·5	·200	2·3	0·5	82·4	543·6	6·75	6·50	9·00	8·25	0·50	...	248·5	8·3	1·3	17	2·40	2·01
37·3	·222	2·6	0·6	81·5	540·1	4·75	5·25	10·50	8·50	0·00	...	296·6	7·2	2·5	16	1·76	1·74
39·2	·240	2·7	0·8	77·8	536·4	4·75	5·75	11·25	8·25	1·00	...	227·6	7·0	1·0	13	1·86	1·54
41·3	·261	2·9	1·1	73·6	534·8	8·25	6·25	7·25	8·25	0·00	...	210·4	6·5	1·0	10	1·84	1·56
45·5	·307	3·4	1·5	69 0	527·3	4·00	2·50	10·00	14·50	0·00	...	184·5	6·0	2·0	12	1·84	1·76
50·2	·364	4·0	1·7	70·5	525·1	6·50	3·25	9·75	11·50	0·00	...	200·6	5·5	3·0	4	0·53	0·48
53·8	·414	4·6	2·3	66·1	519·5	9·75	7·25	5·75	8·25	0·00	...	163·1	5·1	2·5	7	0·52	0·39
54·8	·431	4·8	1·5	75·5	517 5	5·75	3 50	10·25	11·50	0·00	...	105·2	6·0	2·5	16	4·60	4·33
49·7	·357	4·0	1·3	74·5	524·9	7·75	7 25	7·25	7·75	0·00	...	169·4	6·2	1·3	16	3·30	3·12
41·7	·265	3·0	0·9	77·5	533·8	6·50	1·50	9·75	13·25	0·00	...	106·1	6·1	1·3	16	2·45	2·18
34·6	·201	2·3	0·6	80·2	545·1	12·00	7·00	5·25	5·75	0·00	...	197·9	7·7	0·6	15	2·12	1·76
37·8	·227	2·6	0·6	81·5	529·0	4·75	2·50	11·75	12·00	0·00	...	207·0	7·1	0·6	20	3·73	3·16
43·4	·291	3·3	1·1	75·8	531·4	80·50	58·50	107·75	117·75	1·50	...	193·6	6·6	1·6	162	25·95	24·03

Long. 8° 0′ W. Height above Sea 304 feet.

38·2	·231	2·7	0·3	92·0	...	3·50	7·50	9·50	10·50	0·00	...	...	7·1	4·6	10	3·42	...
35·3	·206	2·4	0·6	80·5	...	0·50	0·00	11·50	17·00	0·00	...	...	5·2	4·2	5	2·01	...
43·3	·281	3·2	0·9	79·5	...	1·50	0·00	13·00	16·50	0·00	...	...	6·8	4·4	17	3·08	...
45·0	·299	3·4	1·1	74·0	...	3·50	4·50	14·50	7·50	0·00	...	...	5·3	4·5	5	1·37	...
49·4	·354	3·9	1·5	73·5	...	3·50	3·50	13·00	11·00	0·00	...	...	6·4	4.2	10	2·46	...
57·5	·474	5·2	1·2	82·0	...	2·00	1·50	13·00	13·50	0·00	...	...	5·8	5·3	3	1·44	...
55·9	·449	4·9	1·9	71·5	...	*9·50	7·50	1·50	4·50	0·00	...	...	3·4	4·9	2	0·15	...
53·1	·405	4.5	1·9	70·5	...	7·50	4·50	9·00	10·00	0.00	...	...	5·1	4·5	22	3·08	...
52·6	·397	4·4	1·4	75·7	...	8·00	10·00	7·50	4·50	0·00	...	...	4·8	4·3	14	2·04	...
43·9	·287	3·3	0·8	80·0	...	3·00	3·00	*13·00	12·00	0·00	...	...	6·5	4·6	18	2·77	...
38·9	·237	2·7	0·4	87·1	...	6·50	11·50	5·00	7·00	0·00	...	...	7·7	2·9	12	2·28	...
40·4	·250	2·8	0·4	86·0	...	2·50	5·00	13·00	10·50	0·00	...	...	8·3	4·3	25	4·97	...
46·1	·322	3·6	1·0	79·4	...	51·50	58·50	†23·50	124·50	0·00	...	...	5·9	4·4	143	29·07	...

Long. 5° 57′ W. Height above Sea 50 feet.

37·4	·225	2·6	0·5	86·2	542·9	4·00	7·00	9·00	11·00	0·00	...	181·7	5·6	0·7	19	3·41	‡ 3·29
39·6	·244	2·8	0·6	82·8	548·8	1·50	1·00	5·50	21·00	0·00	...	106·0	6·7	0·7	18	3·24	3·10
41·7	·264	3·1	0·6	84·6	543·8	5·50	2·00	5·50	15·00	3·00	...	194·7	6·8	1·8	23	4·55	5·40
42·1	·268	3·0	1·4	67·5	538·8	4·25	2·75	7·50	15·00	0·50	...	126·1	6·1	1·5	12	3·07	3·06
45·2	·301	3·4	1·8	64·2	528·7	2·50	3·50	11·50	11·50	2·00	...	123·2	6·0	1·0	22	2·07	2·03
48·8	·344	3·9	2·4	60·5	531·8	2·00	3·50	4·50	20·00	0·00	...	131·3	5·1	2·6	7	0·58	0·50
52·7	·399	4·4	3·0	58·8	526·0	5·00	6·00	7·50	12·50	0·00	...	110·6	4·7	1·8	7	0·73	0·71
52·7	·399	4·4	2·2	65·8	524·6	4·50	2·50	10·00	14·00	0·00	...	134·8	5·5	2·1	16	5·05	4·81
51·0	·375	4·2	1·3	75·0	530·6	6·75	6·50	9·25	6·00	0·00	...	119·8	6·6	6·7	13	2·20	2·00
42·4	·271	3·0	1·0	76·6	539·6	5·75	11·00	7·75	6·50	0·00	...	131·6	6·8	2·0	19	3·17	3·01
39·3	·241	2·7	0·3	89·9	550·5	7·00	13·00	6·50	3·50	0·00	...	84·6	8·2	0·5	15	2·57	2·52
40·8	·255	2·9	0·4	87·0	536·3	5·25	9·25	10·50	6·00	0·00	...	125·3	8·3	0·1	22	4·88	4·42
44·5	·299	3·4	1·3	74·9	536·4	54·00	68·00	95·00	142·00	5·50	...	130·8	6·4	1·8	193	35·51	33·78

* Eight days not taken. † 1·50 days not taken. ‡ 30 feet above the ground.

Appendix

BUTTEVANT. Lat. 52° 14′ N.

Month.	Readings of the Barometer.			Temperature of the Air.							Mean Daily Readings of			
	Mean reduced and corrected to 32°.	Highest reduced and corrected to 32°.	Lowest reduced and corrected to 32°.	Highest during Month.	Lowest during Month.	Range during Month.	Mean				Maximum in Sun's rays.	Maximum on Grass.	Hygrometer.	
							Of all the highest.	Of all the lowest.	Daily Range.	Approximate Temperature.			Dry Bulb.	Wet Bulb.
January	...	...	...	...	...	...	...	...	...	...	...	...	...	...
February	...	...	...	...	...	...	...	...	...	...	...	...	...	...
March	...	...	...	...	...	...	...	...	...	...	...	...	...	...
April	...	...	...	...	...	...	...	...	...	...	...	...	...	...
From 5th inclusive:—														
May	...	...	...	77·8	30·2	47·6	69·4	42·3	27·1	55·8	...	...	58·3	53·3
June	...	...	...	85·0	35·0	50·0	73·6	47·5	26·1	60·5	...	...	62·9	57·7
July	...	...	...	95·0	39·0	56·0	83·2	49·8	33·4	66·5	...	...	70·6	64·1
August	...	...	...	90·0	37·0	53·0	73·8	47·8	26·0	60·8	...	...	62·6	58·6
September	...	...	...	84·0	34·0	50·0	73·6	46·4	27·2	60·0	...	...	62·0	59·2
October	...	...	...	72·0	27·0	45·0	62·4	37·8	24·6	50·1	...	...	50·9	48·8
November	...	...	...	67·0	23·0	44·0	57·8	32·7	25·1	45·2	...	...	44·2	42·5
December	...	...	...	61·0	27·0	34·0	56·7	36·9	19·8	46·8	...	...	45·4	43·4
Yearly Sums, Means, and Totals. ...	...	...	...	78·9	31·6	47·4	68·8	42·6	26·2	55·7	...	...	57·1	53·2

CORK. Lat. 51° 53′ N.

January	29·565	30·030	29·121	55·0	30·7	24·3	49·6	34·1	14·5	41·3	58·9	30·6	44·8	42·5
February	29·799	30·224	28·971	62·0	26·0	36·0	51·8	36·1	15·7	43·9	67·7	32·9	45·9	44·1
March	29·874	30·267	28·974	65·0	29·2	35·8	54·5	36·5	18·0	45·5	69·8	33·4	47·0	45·1
April	29·623	30·122	28·921	69·0	29·5	39·5	59·8	37·5	22·3	48·6	94·7	33·7	53·3	51·3
May	29·459	29·806	28·890	70·5	35·3	35·3	63·7	42·4	16·3	55·5	105·6	44·7	60·5	55·2
June	29·772	30·000	29·336	82·2	40·0	42·2	70·4	47·7	22·7	59·0	121·5	44·7	63·4	58·9
July	29·754	30·071	29·627	84·7	41·0	43·7	76·8	51·8	25·0	64·3	126·7	...	67·9	64·1
August	29·583	30·079	29·040	78·0	41·0	37·0	67·8	49·1	18·7	58·4	112·9	...	62·2	58·0
September ...	29·448	29·999	28·511	74·4	35·0	39·0	64·9	41·6	23·3	53·2	94·8	38·2	59·8	57·4
October	29·612	29·997	29·107	63·0	22·0	41·0	56·8	33·2	23·6	45·0	76·7	29·2	51·3	49·5
November	29·871	31·269	28·767	59·0	27·0	32·0	54·6	30·5	24·1	42·5	67·3	25·9	45·8	44·2
December	29·027	29·819	28·502	57·0	20·0	37·0	51·9	28·7	23·2	40·3	63·6	23·1	45·8	44·1
Yearly Sums, Means, and Totals ...	29·616	30·140	28·956	68·3	31·4	36·9	60·1	39·5	20·6	49·8	88·3	...	54·0	51·2

CURRAGH CAMP. Lat. 52° 8′ N.

January	29·334	29·870	28·300	53·7	21·0	32·7	44·3	32·2	12·1	38·2	47·2	23·1	40·4	39·2
February	29·571	30·156	28·618	55·0	27·8	27·2	48·0	34·4	13·6	41·2	56·9	25·8	43·7	41·6
March	29·439	30·075	28·325	61·9	28·5	33·4	51·6	36·2	15·4	43·9	70·7	27·9	46·7	44·3
April	29·507	29·976	28·440	65·9	32·7	33·2	57·7	38·0	19·7	47·8	89·2	28·7	50·7	46·1
May	29·410	29·819	28·729	67·5	32·5	35·0	63·1	42·2	20·9	52·6	98·3	31·9	56·4	51·3
June	29·617	29·943	29·147	77·2	36·0	41·2	68·2	45·8	22·4	57·0	105·0	34·3	61·0	55·3
July	29·490	30·014	29·034	86·7	41·0	45·7	73·5	49·6	23·9	61·5	106·8	35·4	66·2	60·1
August	29·385	29·806	28·569	84·3	38·0	46·3	68·3	47·8	20·5	58·0	97·6	40·3	61·7	57·1
September	29·345	29·916	28·408	78·7	37·0	41·7	63·8	47·0	16·8	55·4	92·4	36·0	58·4	55·3
October	29·424	29·803	28·758	64·8	27·0	37·8	53·6	36·6	17·0	45·1	76·7	24·1	47·7	45·3
November	29·519	30·242	28·437	63·9	38·5	25·4	47·1	33·4	13·7	40·2	60·7	20·9	44·0	42·4
December	28·884	29·597	28·189	61·5	26·4	35·1	49·4	36·1	13·3	42·7	56·1	22·4	43·9	42·3
Yearly Sums, Means, and Totals ...	29·410	29·935	28·579	68·4	32·2	36·2	57·4	39·9	17·5	48·6	79·8	29·2	51·7	48·4

No XXVII—*continued.*

Lon. 8° 40′ W. Height above Sea feet.

Hygrometrical Results from Glaisher's Tables.						Atmospherical Condition.											
		In a Cubic Foot of Air.				Number of Days for mean Direction of Wind.					Calculated from Robinson's Anemometer.					Amount of Rain fall.	
Mean Temperature of Dew Point.	Mean elastic Force of Vapour.	Mean Weight of Vapour.	Mean additional Weight required for Saturation.	Mean Degree of Humidity.	Mean Weight of Cubic Foot of Air.	North.	East.	South.	West.	Number of calm, or nearly calm, Days.	Mean daily pressure of Wind.	Mean daily Horizontal Movement of the Air.	Amount of Cloud 0—10.	Ozone Scale 0—10.	Number of Days on which Rain fell.	On the Ground.	Feet above the Ground.
											lbs. per sq. foot.	Miles.				Inches.	Inches.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
48·8	·346	3·9	1·6	71·0	...	0·00	8·00	11·25	7·75	0·00	...	...	3·8	7·0	16	1·74	...
53·3	·408	4·5	1·8	71·0	...	6·50	6·75	12·00	4·75	0·00	...	...	4·5	6·8	7	0·94	...
59·1	·503	5·4	2·7	67·0	...	14·50	4·50	8·00	4·00	0·00	...	...	4·0	6·7	9	1·16	...
55·2	·436	4·9	1·4	77·0	...	9·50	1·00	9·50	11·00	0·00	...	...	6·0	7·0	15	6·83	...
56·8	·462	5·1	1·0	83·2	...	8·00	3·00	9·50	9·50	0·00	...	...	4·5	6·0	18	2·30	...
46·6	·327	3·6	0·5	86·2	...	8·25*	1·50*	10·75*	10·00*	0·00*	...	...	5·2	6·7	20	0·99	...
40·5	·252	2·9	0·4	86·8	...	7·50	6·00	9·00	7·50	0·00	...	...	5·7	6·0	17	3·85	...
41·1	·258	2·9	0·5	85·4	...	2·00	3·00	18·25	7·75	0·00	...	...	5·9	6·3	30	6·90	...
50·2	·374	4·1	1·2	78·4	...	56·25	33·75	88·25	62·25	0,00	...	...	4·9	6·5	127	24·71	...

Long. 8° 21′ W. Height above Sea 257 feet.

																	†
39·8	·246	2·8	0·6	83·2	542·7	7·50	9·00	10·25	4·25	0·00	...	274·7	6·5	2·7	24	4·97	4·55
42·0	·267	3·0	0·5	86·5	545·7	8·75	4·00	10·50	5·75	0·00	...	258·6	6·0	2·5	22	1·51	1·20
43·0	·277	3·2	0·5	86·7	545·8	6·00	5·25	13·75	6·00	0·00	...	288·5	6·5	2·5	16	3·36	3·14
49·3	·351	3·9	0·6	86·3	534·1	7·25	6·75	10·00	6·00	0·00	...	226·8	5·6	2·8	9	1·16	1·08
50·6	·369	4·1	1·8	69·5	523·5	4·25	6·50	12·00	8·25	0·00	...	256·1	6·1	3·7	12	0·47	0·38
55·1	·436	4·8	1·6	74·9	525·8	6·00	5·25	11·00	7·75	0·00	...	142·2	5·0	3·5	9	0·83	0·77
61·0	·539	5·8	1·6	79·0	520·5	7·75	7·00	10·50	5·75	0·00	...	137·8	5·3	3·3	5	1·09	0·97
54·4	·424	4·7	1·5	76·0	523·8	6·50	6·25	8·75	9·50	0·00	...	156·5	7·0	3·5	11	4·66	4·33
55·3	·438	4·8	0·9	85·6	523·5	6·00	11·25	9·50	3·25	0·00	...	115·2	7·2	4·6	13	4·82	4·38
47·7	·332	3·7	0·5	87·7	536·2	8·25	5·50	6·25	11·00	0·00	...	149·0	6·7	5·2	5	3·16	2·82
42·3	·271	3·1	0·5	88·0	547·1	9·25	6·75	6·50	7·50	0,00	...	113·1	6·7	5·3	11	4·97	4·67
42·1	·268	3·0	0·5	87·2	531·7	4·75	4·50	11·25	10·50	0·00	...	121·8	8·0	5·5	27	9·61	8·78
48·6	·351	3·9	0·9	82·5	533·4	82·25	78·00	120·25	85·50	0·00	...	195·0	6·4	3·8	164	40·61	37·07

Long. 4° 48′ W. Height above Sea 450 feet.

																	‡
37·7	·226	2·6	0·3	90·4	543·4	4·50	4·25	8·25	10·00	4·00	...	360·5	7·3	4·2	15	2·36	1·73
39·1	·239	2·7	0·5	83·9	544·1	3·50	0·25	10·00	15·25	0·00	...	435·3	6·6	4·8	12	2·45	2·14
41·6	·263	3·0	0·6	83·2	538·2	5·50	0·75	9·25	15·50	0·00	...	400·1	6·4	4·4	19	3·23	2·78
41·3	·260	2·9	1·2	71·1	535·2	3·75	1·75	9·50	9·00	6·00	...	284·1	4·9	3·8	12	2·41	2·02
46·5	·319	3·5	1·5	69·5	527·4	3·75	6·75	12·00	8·50	0·00	...	370·6	4·6	4·5	14	2·01	1·66
50·4	·365	4·1	1·9	68·5	525·9	4·75	2·50	9·50	12·25	1·00	...	286·3	4·6	3·9	5	2·18	1·96
55·1	·435	4·8	2·2	67·7	518·2	9·25	4·25	4·50	10·00	3·00	...	241·0	5·1	3·8	5	1·39	1·16
53·1	·404	4·5	1·6	74·0	520·8	6·75	3·50	8·25	11·50	1·00	...	310·7	6·0	4·2	12	3·12	2·74
52·5	·396	4·4	1·1	80·8	523·8	4·00	10·75	8·00	6·25	1·00	...	287·3	6·7	3·6	14	3·54	3·14
43·7	·285	3·2	0·5	87·4	536·7	4·25	1·75	9·25	15·75	0·00	...	300·8	5·7	4·2	16	2·54	1·93
40·5	·252	2·9	0·4	87·2	542·6	5·75	5·75	8·50	6·50	3·50	...	320·8	7·2	3·8	14	1·72	1·38
41·5	·263	3·0	0·2	91·2	549·3	2·25	1·00	16·25	10·50	1·00	...	428·9	6·9	4·2	23	5·77	4·85
45·2	·309	3·5	1·0	79·6	533·8	58·00	43·25	113·25	131·00	20·25	...	335·8	6·0	4·1	161	32·72	27.49

* Half day not taken. † 25 feet above the ground. ‡ 26 feet above the ground.

Appendix

DUBLIN. Lat. 55° 25′ N.

Month.	Readings of the Barometer.			Temperature of the Air.							Mean Daily Readings of			
	Mean reduced and corrected to 32°.	Highest reduced and corrected to 32°.	Lowest reduced and corrected to 32°.	Highest during Month.	Lowest during Month.	Range during Month.	Mean				Maximum in Sun's rays.	Minimum on Grass.	Hygrometer.	
							Of all the highest.	Of all the lowest.	Daily Range.	Approximate Temperature.			Dry Bulb.	Wet Bulb.
January	29·735	30·212	28·744	58·2	29·0	29·2	48·3	38·1	10·2	43·2	62·8	32·3	43·6	41·2
February	30·090	30·474	28·966	58·6	27·0	31·6	51·1	38·3	12·8	44·7	83·7	33·7	46·6	44·3
March	30·147	30·633	29·961	62·5	29·3	33·2	54·4	39·5	14·9	46·9	90·8	35·6	48·3	4[illegible]·3
April	29·958	30·524	28·891	65·5	28·0	37·5	53·6	39·2	19·4	48·9	105·8	35·0	52·6	48·8
May	29·815	30·246	29·207	73·6	35·0	38·6	64·1	45·1	19·0	54·6	111·9	40·6	58·0	54·6
June	30·029	30·302	29·512	78·0	38·4	39·6	70·3	48·8	21·5	59·5	122·8	45·2	62·3	58·0
July	29·964	30·384	29·281	87·5	42·8	44·7	74·5	51·4	23·1	62·9	121·3	49·2	67·2	61·1
August	29·771	30·151	28·874	83·5	40·0	43·5	69·3	50·6	18·7	59·9	114·1	45·4	63·7	57·8
September	29·696	30·270	28·765	82·5	39·5	43·0	64·6	50·5	14·1	57·5	103·0	45·5	59·7	56·1
October...	29·934	30·185	29·080	63·8	31·0	32·8	56·0	39·6	16·5	47·7	92·2	34·9	50·1	47·1
November	29·834	30·311	28·805	64·2	25·2	39·2	49·3	37·4	11·8	43·3	70·7	32·4	45·0	42·6
December	29·212	30·041	28·517	62·8	28·3	34·8	51·1	39·3	11·8	45·2	71·2	34·6	46·2	44·0
Yearly Sums, Means, and Totals ...	29·849	30·311	29·050	70·1	62·8	37·3	59·3	43·1	16·1	51·2	95·9	38·7	53·6	50·2

FERMOY. Lat. 52° 2′ N.

January	...	...	...	55·8	18·6	37·2	47·6	34·0	13·6	40·8	...	...	42·4	41·5
February	...	...	...	61·6	27·0	34·6	51·8	36·8	15·0	44·3	...	...	46·7	44·0
March	...	...	...	66·8	29·4	37·4	55·0	38·4	16·6	46·7	...	...	49·1	46·1
April	...	...	...	69·4	28·4	41·0	59·8	39·0	20·8	49·4	...	...	53·0	47·8
May	...	...	...	68·4	33·4	35·0	63·3	44·7	18·6	54·0	...	...	57·5	52·3
June	...	...	...	81·4	38·2	43·2	69·2	49·0	20·2	59·1	...	...	62·4	58·3
July	...	...	...	86·4	39·6	46·8	77·2	51·5	25·7	61·3	...	...	68·5	64·5
August	...	...	...	81·8	40·6	41·2	69·1	50·2	18·9	59·6	...	...	62·5	59·0
September	...	...	...	74·6	36·2	38·4	66·4	48·9	17·5	57·6	...	...	59·2	56·8
October...	...	...	...	65·7	30·0	35·7	57·7	41·8	15·9	49·7	...	...	50·5	48·3
November	...	...	...	61·0	24·0	37·0	52·3	35·0	17·3	43·6	...	...	44·5	42·4
December	...	...	...	57·0	28·2	28·8	52·6	36·6	16·0	44·6	...	...	45·7	44·4
Yearly Sums, Means, and Totals ...	...	...	...	69·2	31·2	38·0	60·2	42·2	18·0	51·2	...	...	53·5	50·4

TEMPLEMORE. Lat. 52° 48′ N.

January	...	...	...	53·0	19·0	34·0	50·6	34·6	16·0	42·6	58·4	...	40·7	40·0
February	...	...	...	58·0	25·0	23·0	51·1	35·0	16·1	43·0	77·0	...	43·9	42·4
March	...	...	...	64·0	27·0	37·0	54·2	36·6	17·6	45·4	84·9	...	48·6	46·5
April	...	...	...	68·0	30·0	38·0	60·1	37·5	22·6	48·8	105·6	...	52·8	51·1
May	...	...	...	69·0	31·0	38·0	64·3	41·3	23·0	52·8	121·7	...	57·8	53·4
June	...	...	...	80·0	38·0	42·0	69·7	46·7	23·0	58·2	130·4	...	63·8	58·2
July	...	...	...	88·0	40·0	48·0	76·2	50·1	26·1	63·1	126·0	...	69·2	62·8
August	...	...	...	83·0	37·0	46·0	69·1	47·6	21·5	58·3	113·7	...	62·6	58·7
September	...	...	...	78·0	37·0	41·0	64·5	46·2	18·3	55·3	104·2	...	58·9	55·7
October...	...	...	...	61·0	26·0	35·0	55·6	35·6	20·0	45·6	86·7	...	49·1	47·2
November	...	...	...	61·0	22·0	39·0	47·5	38·2	14·3	40·3	62·4	...	43·0	41·6
December	...	...	...	57·0	24·0	33·0	48·9	34·5	14·4	41·7	57·0	...	44·9	43·9
Yearly Sums, Means, and Totals ...	...	...	...	68·3	29·7	38·7	59·3	39·9	19·4	49·6	94·0	...	52·9	50·1

No. XXVII—*continued.*

Long. 6° 20′ W. Height above Sea 72 feet.

Hygrometrical Results from Glaisher's Tables.						Atmospherical Conditions.											
		In a Cubic Foot of Air.				Number of Days for mean Direction of Wind.					Calculated from Robinson's Anemometer.				Amount of Rain fall	
Mean Temperature of Dew Point.	Mean elastic Force of Vapour.	Mean Weight of Vapour.	Mean additional Weight required for Saturation.	Mean Degree of Humidity.	Mean Weight of Cubic Foot of Air.	North.	East.	South.	West.	Number of calm, or nearly calm, Days.	Mean daily pressure of Wind.	Mean daily Horizontal Movement of the Air.	Amount of Cloud 0—10.	Ozone Scale 0—10.	Number of Days on which Rain fell.	On the Ground.	Feet above the Ground.
											lbs. per sq. foot	Miles				Inches	Inches
38·4	·332	2·7	0·6	81·4	547·2	4·50	3·25	9·25	14·00	0·00	...	115·8	7·5	2·4	20	2·59	...
41·7	·264	3·0	0·6	83·9	550·4	3·00	0·00	8·25	16·75	1·00	...	129·5	5·8	4·4	15	1·45	...
44·1	·289	3·3	0·5	86·0	549·2	4·75	0·00	5·50	17·25	2·50	...	118·2	7·0	4·8	18	2·21	...
44·9	·299	3·4	1·1	75·8	541·2	3·50	3·75	10·75	9·50	2·50	...	70·5	5·9	3·9	13	1·82	...
51·5	·382	4·3	1·1	79·0	532·4	2·50	6·00	12·50	9·50	0·50	...	76·6	5·3	4·2	13	1·20	...
54·3	·423	4·7	1·6	75·5	531·5	5·25	2·25	7·00	15·50	0·00	...	81·1	5·6	5·6	9	0·69	...
56·2	·453	5·0	2·3	67·5	525·3	8·50	4·50	6·50	11·00	0·50	...	55·7	4·7	5·9	7	0·75	...
52·9	·401	4·5	2·1	68·2	536·0	6·25	2·25	9·50	13·00	0·00	...	79·2	5·7	4·8	17	4·46	...
52·9	·401	4·5	1·2	79·1	528·4	7·00	3·00	7·75	6·25	1·00	...	63·9	6·4	2·8	12	2·56	...
43·9	·287	3·3	0·8	80·0	543·6	5·50	0·75	4·50	18·75	1·50	...	87·5	5·5	4·7	17	1·20	...
39·8	·245	2·8	0·6	82·2	547·4	8·25	2·75	7·75	11·25	0·00	...	102·8	7·2	1·6	21	1·80	...
41·5	·262	3·0	0·6	84·6	534·7	3·50	0·50	10·50	16·50	0·00	...	143·8	7·0	3·7	28	4·70	...
46·8	·328	3·7	1·1	78·6	538·9	62·50	34·00	99·75	159·25	10·50	...	93·6	6·1	4·1	190	25·43	...

Long. 8° 18′ W. Height above Sea 176 feet.

40·4	·252	2·9	0·2	92·8	...	4·00	6·00	4·75	13·25	3·00	...	...	7·6	...	20	4·37	...
40·9	·257	3·0	0·7	81·1	...	4·25	1·25	8·75	12·75	2·00	...	...	7·8	...	17	1·86	...
42·9	·277	3·1	0·9	79·1	...	6·00	0·75	6·50	15·25	2·50	...	...	8·1	...	24	3·34	...
42·6	·273	3·0	1·4	68·0	...	4·00	3·00	6·50	8·50	8·00	...	...	6·8	...	15	3·22	...
47·6	·330	3·7	1·6	69·5	...	7·00	7·50	7·00	9·50	0·00	...	...	4·6	5·5	16	1·68	...
54·8	·430	4·8	1·5	76·5	...	2·50	2·50	5·00	6·00	13·00	...	...	3·1	5·6	6	1·39	...
61·3	·543	5·9	1·7	78·0	...	1·50	1·50	2·50	4·50	21·00	...	...	2·3	5·1	6	1·16	...
56·0	·449	5·0	1·3	79·5	...	5·00	3·50	4·00	6·50	13·00	...	...	4·2	5·7	15	4·37	...
54·6	·428	4·8	0·8	85·8	...	4·50	4·00	3·00	0·50	18·00	...	...	4·1	5·5	12	2·74	...
46·0	·311	3·5	0·6	85·1	...	7·75	3·50	8·50	11·25	0·00	...	...	4·5	6·3	22	2·62	...
39·9	·247	2·8	0·5	84·2	...	5·75	6·50	7·75	10·00	0·00	...	...	5·5	4·8	15	4·48	...
42·9	·277	3·1	0·4	90·3	...	2·00	5·00	14·00	10·00	0·00	...	...	5·9	4·7	30	8·18	...
47·5	·339	3·8	1·0	80·8	...	54·25	46·00	78·25	107·00	89·50	...	...	5·4	...	198	39·41	...

Long. 7° 49′ W. Height above Sea feet.

39·0	·239	2·8	0·1	94·4	...	3·00	3·00	12·50	12·50	0·00	...	...	3·8	7·4	18	2·10	...
40·6	·254	2·9	0·4	88·0	...	0·50	4·50	8·50	15·50	0·00	...	...	7·1	4·6	22	3·18	...
44·2	·291	3·3	0·6	85·3	...	4·00	9·50	5·00	12·50	0·00	...	...	7·7	4·5	24	3·76	...
49·4	·353	4·0	0·5	88·9	...	0·50	2·50	5·50	5·50	16·00	...	...	6·8	4·7	14	2·64	...
49·4	·353	3·9	1·4	73·4	...	1·25	7·25	11·50	8·50	2·50	...	...	6·4	4·5	17	2·04	...
53·5	·411	4·6	2·0	69·8	...	0·00	8·50	13·00	8·00	0·50	...	...	6·4	4·7	9	1·47	...
57·8	·478	5·2	2·6	66·4	...	2·00	6·00	5·75	9·25	8·00	...	...	5·2	5·1	7	0·69	...
55·4	·439	4·9	1·4	77·5	...	2·00	6·00	8·25	6·75	8·00	...	...	7·0	4·8	18	0·50	...
52·8	·401	4·4	1·1	80·7	...	2·00	4·25	5·00	5·25	13·50	...	...	7·4	4·3	16	4·20	...
45·1	·301	3·4	0·5	86·8	...	1·75	8·25	5·00	3·50	12·50	...	...	7·4	4·2	22	3·30	...
39·9	·246	2·8	0·4	88·8	...	2·25	7·50	5·00	2·25	13·00	...	...	8·0	4·9	18	2·06	...
42·8	275	3·2	0·2	92·9	...	3·25	9·00	3·75	3·00	12·00	...	...	7·9	6·0	31	7·40	...
47·5	·337	3·8	0·9	82·7	...	22·50	76·25	88·75	92·50	86·00	...	...	6·8	5·0	216	33·34	...

APPENDIX

Abstract of Results of Meteorological Observations

GIBRALTAR. Lat. 36° 6′ N.

Month.	Readings of the Barometer.			Temperature of the Air.							Mean Daily Readings of			
							Mean						Hygrometer.	
	Mean reduced and corrected to 32°.	Highest reduced and corrected to 32°.	Lowest reduced and corrected to 32°.	Highest during Month.	Lowest during Month.	Range during Month.	Of all the highest.	Of all the lowest.	Daily Range.	Approximate Temperature.	Maximum in Sun's rays.	Minimum on Grass.	Dry Bulb.	Wet Bulb.
January	30·168	30·472	29·505	67·0	39·0	28·0	60·9	47·2	13·7	54·0	86·6	42·0	56·3	54·3
February	30·233	30·418	30·018	67·0	40·5	26·5	61·2	46·0	15·2	53·6	88·8	41·1	56·9	52·7
March	30·115	30·450	29·797	73·0	42·0	31·0	65·4	50·6	14·8	58·0	102·2	44·7	60·7	55·8
April	30·025	30·370	29·636	77·0	48·0	29·0	69·4	52·9	16·5	61·1	107·6	49·1	63·9	58·7
May	29·983	30·218	29·825	83·5	53·0	30·5	72·4	57·6	14·8	65·0	114·4	55·2	67·6	63·1
June	30·018	30·166	29·747	88·0	58·0	30·0	81·0	62·8	18·2	71·9	126·3	59·8	72·4	68·5
July	29·995	30·119	29·885	91·5	59·0	32·5	84·9	64·2	20·7	74·5	134·5	59·9	77·3	68·1
August	30·019	30·141	29·819	88·5	57·0	31·5	82·6	63·8	18·8	73·2	119·0	...	75·5	69·0
September	29·980	30·196	29·745	82·5	55·0	27·5	76·9	62·3	14·6	69·6	102·6	...	71·6	66·4
October...	30·061	30·381	29·715	76·0	48·0	28·0	69·5	55·5	14·0	62·5	95·3	52·2	65·8	60·9
November	30·085	30·266	29·785	70·0	41·0	29·0	64·2	51·8	12·4	58·0	81·8	49·6	60·3	56·6
December	30·148	30·375	29·769	69·0	41·0	28·0	63·8	49·3	14·0	56·3	85·9	46·4	58·8	55·5
Yearly Sums, Means, and Totals ...	30·069	30·297	29·770	77·7	48·5	29·2	71·0	55·3	15·7	63·1	103·7	40·0	65·6	60·8

MALTA. Lat. 30° 35′ N.

January	29·766	30·300	29·270	66·1	44·7	21·4	59·5	51·1	8·4	55·3	110·6	43·8	56·9	52·1
February	30·037	30·242	29·865	64·9	45·5	19·4	60·1	51·0	9·1	55·5	119·5	42·7	57·0	52·5
March	29·719	30·056	29·278	70·2	42·9	27·3	60·3	50·5	9·8	55·4	114·4	44·7	57·2	53·1
April	29·849	30·117	29·364	75·8	48·2	27·6	65·1	54·7	10·4	59·9	120·6	51·4	62·0	57·9
May	29·814	30·055	29·473	80·2	59·3	20·9	72·3	63·3	9·0	67·8	128·9	59·8	69·5	67·7
June	29·816	29·975	29·648	84·8	61·2	23·6	78·7	68·7	10·0	73·7	134·2	65·2	76·1	74·6
July	...	...	...	92·2	68·9	23·3	84·7	73·4	11·3	79·0	138·6	68·6	80·7	73·8
August	29·884	30·054	29·748	92·4	72·1	20·3	86·0	75·6	10·4	80·8	142·2	70·2	82·2	74·1
September	29·927	30·126	29·642	86·2	66·0	20·2	81·6	71·9	9·7	76·7	137·4	65·4	78·8	71·8
October...	29·882	30·127	29·546	87·1	55·0	32·1	75·2	65·3	9·9	70·2	129·5	61·4	72·9	67·1
November	29·882	30·235	29·545	82·1	50·1	32·0	65·7	56·4	9·3	61·0	121·7	...	63·0	57·3
December	30·044	30·325	29·873	70·1	53·5	16·6	64·3	56·8	7·5	60·5	117·3	...	62·0	57·8
Yearly Sums, Means, and Totals ...	29·875	30·137	29·568	78·5	55·6	22·9	71·1	61·6	9·5	66·3	126·2	57·6	68·2	63·3

SCUTARI. Lat. 41° 0′ N.

January	29·932	30·309	29·498	60·0	26·6	33·4	48·3	36·5	11·8	42·4	68·1	32·3	45·0	42·5
February	30·072	30·329	29·679	57·6	21·4	36·2	46·5	31·5	15·0	39·0	91·3	27·0	42·2	38·9
March	29·829	30·266	29·259	63·6	26·0	37·6	50·3	35·4	14·9	42·8	89·0	31·8	45·3	42·6
April	29·993	30·256	29·519	74·2	26·6	47·6	60·3	40·4	19·9	50·3	110·3	35·6	54·7	50·3
May	29·971	29·080	29·800	85·2	40·4	44·8	73·0	51·2	21·8	62·1	123·7	44·3	67·0	59·6
June	29·859	30·077	29·677	95·0	48·8	46·2	83·2	59·7	23·5	71·4	135·0	51·9	76·8	67·1
July	29·765	29·938	29·557	93·0	57·2	35·8	85·3	64·1	21·2	74·7	136·6	57·9	78·5	70·9
August	29·796	29·973	29·630	95·2	58·0	37·2	85·9	64·5	21·4	75·2	133·3	58·7	79·2	71·6
September	29·922	30·107	29·714	86·2	55·0	31·2	81·0	59·3	21·7	70·1	127·6	51·6	74·2	68·1
October...	29·965	30·161	29·832	87·0	44·8	42·2	75·7	55·4	20·3	65·5	116·3	48·0	69·2	63·5
November	29·937	30·211	29·511	73·0	31·4	41·6	56·7	44·8	11·9	50·7	80·1	39·1	52·8	48·7
December	30·042	30·349	29·648	60·2	31·0	29·2	53·6	40·6	13·0	47·1	81·3	33·6	49·3	46·1
Yearly Sums, Means, and Totals ...	29·917	30·171	29·610	77·5	38·9	38·6	66·6	48·6	18·0	57·6	107·7	42·6	61·2	55·8

No. XXVIII.

taken at Foreign Stations in the Year 1868.

Long. 5° 20′ W. Height above Sea 50 feet.

Hygrometrical Results from Glaisher's Tables.						Atmospherical Conditions.											
		In a Cubic Foot of Air.				Number of Days for mean Direction of Wind.					Calculated from Robinson's Anemometer.					Amount of Rain fall.	
Mean Temperature of Dew Point.	Mean elastic Force of Vapour.	Mean Weight of Vapour.	Mean additional Weight required for Saturation.	Mean Degree of Humidity.	Mean Weight of Cubic Foot of Air.	North.	East.	South.	West.	Number of calm, or nearly calm, Days.	Mean daily pressure of Wind.	Mean daily Horizontal Movement of the Air.	Amount of Cloud 0—10.	Ozone Scale 0—10.	Number of Days on which Rain fell.	On the Ground.	25 Feet above the Ground.
											lbs. per sq. foot	Miles				Inches	Inches
52·4	·395	4·4	0·6	87·0	540·4	12·75	9·75	0·00	8·50	0·00	...	539·8	2·9	3·5	4	2·22	2·09
48·9	·346	3·9	1·2	74·7	541·2	6·75	11·75	3·50	7·00	0·00	...	445·7	3·5	3·5	8	4·00	3·64
51·5	·382	4·3	1·7	71·5	535·0	4·75	20·50	2·75	3·00	0·00	...	699·0	1·8	3·2	5	0·73	0·61
54·3	·424	4·7	1·8	71·9	529·9	4·76	12·00	5·75	7·50	0·00	...	603·0	2·7	3·2	7	2·14	1·99
59·6	·510	5·5	1·9	75·5	524·9	1·25	13·75	7·50	8·50	0·00	...	325·6	2·7	3·3	6	3·27	2·83
65·6	·630	6·8	1·8	79·9	519·9	2·00	19·75	1·75	6·50	0·00	...	554·9	1·8	3·2	2	1·32	1·25
61·7	·560	5·9	4·2	58·5	515·3	9·50	2·00	3·00	16·50	0·00	...	355·7	0·6	2·1	0	0·00	0·00
64·3	·604	6·5	3·0	68·0	517·0	7·25	10·50	4·50	8·75	0·00	...	315·3	1·9	3·3	1	0·11	0·10
62·5	·566	6·1	2·3	72·6	520·6	11·00	8·75	0·25	10·00	0·00	...	266·0	4·5	4·0	12	4·35	4·02
56·9	·465	5·2	1·8	73·5	528·4	4·00	14·25	5·75	7·00	0·00	...	...	2·7	3·8	6	1·56	1·44
53·4	·408	4·5	1·3	78·1	534·7	2·00	11·00	4·25	12·75	0·00	...	...	4·5	3·8	9	4·83	4·36
52·5	·396	4.4	1·2	80·0	537·4	5·00	6·75	5·25	14·00	0·00	...	...	3·7	2·7	10	1·92	1·69
57·0	·473	5·2	1·9	74·3	528·7	71·00	140·75	44·25	110·00	0·00	...	...	2·8	3·3	70	26·45	24·02

Long. 14° 30′ E. Height above Sea 111 feet.

																	*
47·7	·331	3·7	1·4	71·1	533·0	9·25	2·25	5·00	11·50	2·00	...	164·5	7·2	3·0	19	3·38	3·33
48·3	·339	3·8	1·4	72·5	537·6	10·25	7·00	2·75	6·00	3·00	...	103·8	5·2	2·1	6	0·54	0·53
49·3	·351	3·9	1·3	74·6	531·7	12·75	4·00	1·75	10·50	2·00	...	174·3	6·3	3·4	19	6·79	6·72
54·4	·424	4·7	1·5	76·5	528·6	10·50	6·25	4·75	7·00	1·50	...	175·8	5·6	3·0	6	2·09	2·07
66·2	·645	7·1	0·8	89·7	519·1	11·00	12·00	1·50	3·50	3·00	...	111·7	4·7	3·8	3	0·08	0·08
73·5	·827	8·9	0·8	91·5	511·7	10·75	6·50	2·50	5·25	3·00	...	83·0	5·0	3·9	5	0·23	0·23
69·1	·713	7·6	3·6	67·4	...	14·00	6·50	0·75	7·75	2·00	...	41·1	2·6	3·7	1	0·08	0·08
68·5	·702	7·5	4·2	63·8	507·9	12·75	7·25	3·00	6·00	2·00	...	54·6	2·5	4·2	2	†	†
67·0	·662	7·0	3·5	67·8	511·9	8·75	7·75	4·50	3·50	5·50	...	69·1	3·7	4·6	6	0·71	0·68
62·7	·573	6·1	2·6	70·9	517·5	7·00	6·75	3·75	6·50	7·00	...	74·8	5·4	4·7	15	5·42	5·31
52·5	·395	4·4	2·0	68·5	528·6	8·75	5·25	3·25	8·75	4·00	...	112·9	5·2	5·5	17	4·69	4·58
54·2	·421	4·6	1·6	76·0	532·1	8·75	7·25	5·50	9·50	0·00	...	161·7	4·6	4·7	9	1·78	1·73
59·4	·532	5·8	2·1	74·2	523·6	124·50	80·75	39·00	85·75	36·00	...	110·6	4·8	3·9	108	25·79	25·34

Long. 29° 3′ E. Height above Sea 60 feet.

																	§
39·6	·243	2·8	0·6	81·5	549·4	‡ 8·50	‡ 7·50	‡ 6·00	‡ 4·00	‡ 0·50	...	301·8	7·9	6·1	16	3·43	2·86
34·8	·203	2·3	0·7	76·2	555·2	6·25	3·25	5·25	4·25	0·00	...	301·7	6·1	5·4	15	2·75	1·94
39·5	·242	2·8	0·7	80·4	546·9	11·25	8·50	6·50	3·25	0·00	...	257·0	8·1	6·2	21	8·04	7·41
46·1	·311	3·5	1·3	72·3	537·7	5·25	2·25	11·25	7·75	0·00	...	186·4	5·4	5·6	13	1·63	1·40
53·7	·413	4·6	2·7	62·4	526·0	8·25	9·25	5·00	3·50	0·00	...	205·9	4·3	4·6	4	0.10	0·08
60·3	·523	5·6	4·3	57·0	513·4	14·25	11·25	2·25	0·25	0·00	...	231·4	2·7	4·5	1	0·64	0·60
65·6	·632	6·8	3·6	65·1	509·8	8·75	5·75	7·50	6·00	0·00	...	197·4	4·0	5·1	8	2·51	2·38
66·4	·648	7·0	3·7	64·8	509·5	8·00	11·00	5·50	3·50	0·00	...	193·1	4·9	5·6	6	5·80	5·24
63·6	·589	6·4	2·7	69·6	516·8	6·50	11·00	5·00	4·00	1·00	...	152·4	3·8	4·7	6	0·37	0·32
59·0	·514	5·5	2·3	69·7	523·4	7·75	7·75	6·50	4·00	1·50	...	146·1	5·0	4·9	6	4·57	4·42
44·6	·295	2·3	1·2	74·2	540·6	7·75	6·75	7·50	5·00	1·50	...	261·8	7·5	6·2	18	5·89	5·15
42·7	·275	3·1	0·9	77·9	546·4	6·00	7·75	7·00	6·25	1·00	...	235·1	5·2	7·2	13	1·00	0·67
51·3	·407	4·4	2·1	70·9	513·3	98·50	92·00	75·25	51·75	5·50	...	222·5	5·4	5·5	127	36·73	32·47

* 26 feet above the ground. † Not appreciable. ‡ 43·00 days not taken. § 20 feet above the ground.

Appendix

QUEBEC. Lat. 46° 48′ N.

Month.	Readings of the Barometer.			Temperature of the Air.			Mean				Mean Daily Readings of			
	Mean reduced and corrected to 32°.	Highest reduced and corrected to 32°.	Lowest reduced and corrected to 32°.	Highest during Month.	Lowest during Month.	Range during Month.	Of all the highest.	Of all the lowest.	Daily Range.	Approximate Temperature.	Maximum in Sun's rays.	Minimum on Grass.	Hygrometer. Dry Bulb.	Hygrometer. Wet Bulb.
January	29·703	30·201	29·064	38·2	20·0	58·2	21·9	0·7	22·6	10·6	*	*	9·7	8·7
February	29·837	30·546	29·012	41·5	22·0	63·5	23·6	4·8	28·4	9·4	...	...	10·3	4·1
March	29·745	30·338	29·290	59·0	21·8	80·8	39·7	16·7	23·1	28·2	...	...	30·1	27·1
April	29·664	30·095	28·890	66·2	2·0	64·2	44·9	20·2	24·7	32·5	85·5	20·3	35·4	30·8
May	29·691	30·026	29·230	88·0	23·2	64·8	60·3	39·2	21·1	49·7	93·7	37·9	53·2	47·9
June	29·706	30·079	29·262	93·2	41·1	52·1	78·8	52·6	26·2	65·7	120·1	51·4	69·5	60·9
July	29·691	29·975	29·436	97·7	47·8	49·9	85·2	61·1	24·1	73·1	121·8	61·4	77·0	68·8
August... ...	29·677	30·109	29·300	87·5	47·3	40·2	75·9	55·7	20·2	65·8	111·7	55·4	68·6	62·7
September ...	29·775	30·164	29·366	76·6	34·0	42·6	62·4	46·6	15·8	54·5	88·9	46·0	56·4	52·5
October... ...	29·852	30·437	29·353	65·0	17·8	47·2	48·5	32·3	16·2	40·4	67·9	31·9	41·7	37·8
November ...	29·743	30·251	29·109	48·6	5·5	43·1	33·0	23·2	2·8	28·1	43·8	24·2	28·8	26·4
December ...	29·676	30·307	28·547	31·0	12·0	43·0	19·1	7·6	11·5	13·3	...	...	13·8	12·5
Yearly Sums, Means, and Totals ...	29·730	30·211	29·155	66·0	11·9	54·1	49·4	29·1	20·3	39·3	...	...	40·3	36·0

* Observations suspended during the extremely cold weather.

HALIFAX, NOVA SCOTIA. Lat. 44° 39′ N.

January	29·710	30·466	29·009	42·2	2·5	44·7	28·8	11·5	17·3	20·1	59·8	10·9	20·9	19·7
February	29·792	30·586	28·918	44·0	5·0	49·0	31·5	10·3	21·2	20·9	66·8	12·9	21·9	20·3
March	29·842	30·515	29·092	52·6	1·0	53·6	40·5	22·0	18·5	31·2	75·2	20·9	32·7	30·6
April	29·755	30·182	28·745	60·0	8·5	51·5	47·1	23·5	23·6	35·3	86·0	24·6	38·6	35·4
May	29·741	30·263	28·949	75·0	20·0	55·0	60·4	37·9	22·5	49·1	95·9	39·3	49·9	46·6
June	29·667	30·083	29·392	84·2	35·0	49·2	71·0	48·6	22·4	59·8	108·6	45·0	61·4	56·8
July	29·645	29·969	29·433	86·6	44·5	42·1	77·2	54·6	22·6	65·9	114·6	52·6	68·0	62·8
August	29·634	30·514	29·245	86·0	40·0	46·0	75·9	54·3	21·6	65·1	115·9	50·7	67·5	64·2
September ...	29·688	30·042	29·336	78·5	36·5	42·0	69·9	50·0	19·9	59·9	95·3	47·9	61·2	57·5
October... ...	29·886	30·475	29·347	72·0	20·0	52·0	56·5	36·2	20·3	46·3	92·5	33·4	48·8	45·3
November ...	29·684	30·695	29·016	65·1	16·4	48·7	43·0	28·8	14·2	35·9	69·9	28·4	37·3	35·1
December	29·678	30·524	28·878	46·0	3·0	43·0	33·2	17·9	15·3	25·5	56·5	19·7	26·9	25·3
Yearly Sums, Means, and Totals ...	29·727	30·359	29·113	66·0	17·9	48·1	52·9	33·0	19·9	42·9	86·4	32·3	43·9	41·6

ST. JOHN'S, NEWFOUNDLAND. Lat. 47° 52′ N.

January	29·481 †	30·423 †	28·582 †	47·0	6·0	53·0	35·2	9·2	26·0	22·2	...	7·6	22·5	22·0
February	29·771	30·299	28·884	45·0	14·8	59·8	33·3	4·1	29·2	18·7	...	3·5	21·0	20·2
March	29·732	30·387	29·153	55·0	2·0	57·0	39·4	16·2	23·2	27·8	...	15·6	30·4	29·6
April	29·613	30·019	29·081	53·0	12·5	40·5	45·7	20·4	25·3	33·0	...	19·9	36·0	34·1
May	30·122	30·163	29·201	71·4	19·0	52·2	57·8	28·3	29·5	43·0	...	27·6	45·8	41·1
June	29·805	30·240	29·505	83·4	28·0	55·4	65·2	38·1	27·1	51·6	...	38·0	53·8	49·5
July	29·704	30·156	29·480	85·2	30·4	54·8	71·6	43·5	28·1	57·5	118·8	43·4	60·1	56·8
August... ...	29·828	30·149	29·504	85·0	39·9	45·1	75·6	50·0	25·6	62·8	115·6	49·5	65·6	61·7
September ...	29·690	30·206	28·855	74·8	28·8	46·0	67·9	43·1	24·8	55·5	104·1	42·6	57·8	54·4
October... ...	29·840	30·283	28·951	71·2	17·5	53·7	60·3	32·4	27·9	46·3	95·5	32·3	46·7	43·7
November ...	29·472	30·288	28·560	56·0	10·9	45·1	46·5	25·4	21·1	35·9	85·8	25·3	35·8	34·9
December	29·482	30·417	28·302	46·2	3·0	43·2	39·6	17·2	22·4	28·4	75·9	17·3	28·1	27·2
Yearly Sums, Means, and Totals ...	29·712	30·252	29·005	64·4	13·9	50·5	53·2	27·3	25·9	40·2	...	26·9	41·9	39·6

† Barron & Co.

No. XXVIII—*continued.*

Long. 71° 12′ W. Height above Sea 230 feet.

Hygrometrical Results from Glaisher's Tables.						Atmospherical Conditions.										
		In a Cubic Foot of Air.				Number of Days for mean Direction of Wind.					Calculated from Robinson's Anemometer.				Amount of Rain fall.	
Mean Temperature of Dew Point.	Mean elastic Force of Vapour.	Mean Weight of Vapour.	Mean additional Weight required for Saturation.	Mean degree of Humidity.	Mean Weight of Cubic Foot of Air.	North.	East.	South.	West.	Number of calm, or nearly calm, days.	Mean daily pressure of Wind.	Mean daily Horizontal Movement of the Air.	Amount of Cloud 0—10.	Ozone Scale 0—10.	Number of days on which rain fell.	On the Ground.	10 Feet above the Ground.
											lbs. per sq. foot	Miles				Inches	Inches
0·9	·046	0·6	0·3	64·5	587·6	4·25	10·25	1·75	14·75	0·00	...	166·4	6·0	1·0	0	0·00	0·00
*	*	*	*	*	591·4	5·75	6·25	1·75	15·25	0·00	...	131·1	5·2	1·1	0	0·00	0·00
17·8	·097	1·1	0·8	58·6	563·5	5·00	9·00	2·75	14·25	0·00	...	124·2	5·4	1·0	0	0·00	0·00
23·5	·126	1·5	0·9	62·0	555·7	8·25	5·75	3·75	14·25	0·00	...	152·3	5·3	1·0	3	0·45	0·42
42·6	·273	3·0	1·5	67·5	535·9	4·00	20·25	2·75	4·00	0·00	...	158·8	7·0	1·1	19	4·01	3·86
54·3	·422	4·6	3·3	58·1	518·7	5·00	10·50	4·50	10.00	0·00	...	123·2	5·7	1·1	7	1·99	1·97
63·0	·577	6·2	3·8	62·2	510·4	6·75	11·00	5·50	7·75	0·00	...	94·2	4·7	1·2	9	4·06	3·87
58·1	·484	5·3	2·3	68·5	518·6	6·75	8·00	3·75	12·50	0·00	...	106·6	5·7	1·2	15	5·16	4·62
48·9	·347	3·9	1·2	76·0	533·6	3·50	12·00	4·50	10·00	0·00	...	113·3	7·2	1·2	19	6·39	6·34
33·9	·189	2·2	0·9	72·1	551·7	8·50	8·50	3·25	10·75	0·00	...	120·2	7·0	1·1	9	0·95	0·90
17·5	·097	1·2	0·7	61·2	565·0	6·50	10·50	1·75	11·25	0·00	...	134·3	7·7	1·0	3	2·19	2·19
2·4	·050	0·6	0·4	61·5	581·9	7·75	7·00	2·25	14·00	0·00	...	161·0	7·8	1·0	0	0·00	0·00
32·9	·246	2·7	1·5	64·7	551·2	72·00	119·00	36·25	138·75	0·00	...	132·1	6·2	1·1	84	25·20	24·17

Long. 63° 36′ W. Height above Sea 125 feet.

11·5	·073	0·9	0·5	66·1	573·8	16·75	3·00	2·50	18·75	0·00	...	280·0	4·7	...	10	4·61	†, ...
9·7	·068	0·8	0·6	59·1	574·2	13·25	3·25	3·75	8·75	0·00	...	278·0	5·5	3·7	8	3·81	...
26·3	·142	1·7	0·4	77·1	562·0	10·75	4·75	4·75	10·75	0·00	...	269·4	6·4	2·6	11	3·83	...
31·1	·174	2·0	0·7	74·6	553·4	8·75	1·25	6·25	13·75	0·00	...	312·4	5·8	4·0	13	5·97	5·08
43·1	·279	3·2	0·9	77·8	540·2	5·00	8·75	12·50	4·75	0·00	...	222·9	6·9	2·5	17	6·58	5·51
52·8	·400	4·4	1·6	74·0	526·1	4·50	3·50	7·00	9·50	5·50	...	203·3	6·9	4·3	14	6·27	5·91
58·7	·495	5·4	2·1	72·0	518·6	5·75	4·50	9·00	11·75	0·00	...	190·9	6·8	4·5	6	1·35	1·20
61·5	·549	6·0	1·4	81·5	518·6	6·75	4·00	5·75	15·50	0·00	...	172·2	6·4	5·1	10	4·05	3·13
54·3	·422	4·7	1·3	78·5	536·5	12·00	4·50	7·25	6·25	0·00	...	238·9	7·1	3·0	16	6·12	4·76
41·5	·263	3·0	0·9	76·3	545·2	14·75	3·25	4·50	8·50	0·00	...	279·6	6·7	3·5	11	6·61	5·67
32·0	·181	2·1	0·5	81·7	553·5	15·75	2·75	4·75	6·75	0·00	...	285·2	7·0	1·8	11	6·06	4·99
17·9	·099	1·1	0·6	68·1	565·7	14·00	3·76	2·25	11·00	0·00	...	286·6	8·3	3·0	6	3·83	2·53
36·7	·262	2·9	1·0	73·9	546·5	128·00	46·25	70·25	116·00	5·50	...	251·6	6·6	3·5	133	59·09	...

Long. 52° 42′ W. Height above Sea 130 feet.

																	‡
18·9	·103	1·3	0·2	86·0	567·2	3·75	1·25	4·50	19·00	2·50	...	266·5	8·0	...	1	0·30	...
14·7	·084	1·0	0·4	75·0	574·8	6·25	0·50	5·50	13·75	3·00	...	288·4	8·0	...	0	0·00	...
27·2	·148	1·7	0·3	87·4	562·5	7·25	2·75	5·00	14·50	1·50	...	232·9	7·9	...	4	0·90	...
31·2	·177	2·0	0·5	82·9	553·8	1·75	0·50	5·75	21·00	1·00	...	370·8	7·5	...	3	0·35	...
35·7	·210	2·4	1·1	68·6	552·2	7·25	5·75	4·25	13·25	0·50	...	237·8	6·0	...	5	1·95	...
45·3	·302	3·4	1·2	73·0	537·1	7.00	5·25	5·25	12·00	0·50	...	340·5	7·2	5·6	15	5·45	...
53·9	·416	4·6	1·2	80·3	528·1	5·50	6·75	7·00	10·75	1·00	...	222·6	6·1	5·8	5	1·26	...
58·5	·492	5·4	1·5	78·5	524·3	3·75	1·00	8·25	18·00	0·00	...	263·7	6·5	4·4	8	3·13	...
51·3	·379	4·2	1·1	79·4	530·4	6·50	7·25	7·25	7·50	1·00	...	183·5	7·6	5·2	7	5·46	...
40·3	·251	2·9	0·7	79·7	545·6	5·25	1·50	6·25	17·00	1·00	...	267·1	7·8	5·6	6	3·00	...
33·5	·193	2·2	0·3	91·8	551·2	6·75	4·75	6·50	10·50	1·50	...	252·1	8·5	5·7	8	6·62	...
23·6	·126	1·5	0·3	82·6	560·6	9·25	2.50	3·00	14·75	1·50	...	276·1	8·8	5·3	7	4·06	...
36·2	·240	2·7	0·7	80·4	549·0	70·25	39·75	68·50	172·00	15·50	...	266·8	7·6	...	69	32·48	...

* Infinitely small. † 40 feet above the ground. ‡ 20 feet above the ground.

Appendix

St. Anne's, Barbados. Lat. 13° 4′ N.

Month	Readings of the Barometer.			Temperature of the Air.							Mean Daily Readings of			
	Mean reduced and corrected to 32°.	Highest reduced and corrected to 32°.	Lowest reduced and corrected to 32°.	Highest during Month.	Lowest during Month.	Range during Month.	Mean: Of all the highest.	Mean: Of all the lowest.	Mean: Daily Range.	Mean: Approximate Temperature.	Maximum in Sun's rays.	Minimum on Grass.	Hygrometer. Dry Bulb.	Hygrometer. Wet Bulb.
January	30·017	30·109	29·943	87·0	68·6	18·4	85·5	71·2	14·3	78·3	116·0	66·2	80·9	73·0
February	30·010	30·103	29·873	87·8	64·5	23·9	85·6	70·3	15·3	77·9	141·0	62·9	80·3	72·7
March	29·958	30·088	29·881	88·9	62·0	26·9	83·8	67·6	16·2	75·7	145·0	63·3	81·8	74·9
April	30·025	30·124	29·959	89·9	70·0	19·9	87·5	72·7	14·8	80·1	148·1	66·3	82·7	72·9
May	30·013	30·113	29·915	90·3	72·0	18·3	88·1	74·1	14·0	81·1	146·1	67·2	84·1	74·1
June	30·024	30·125	29·939	90·8	73·0	17·8	88·9	74·9	14·0	81·9	140·0	69·6	84·4	75·8
July	29·991	30·051	29·899	91·7	70·0	21·7	88·4	74·6	13·8	81·5	138·7	70·0	84·3	75·8
August	29·986	30·060	29·927	91·8	72·2	19·6	88·9	74·3	14·6	81·6	142·0	67·1	84·4	76·6
September	29·946	30·037	29·843	92·6	72·0	20·6	90·1	74·7	15·4	82·4	149·6	69·4	85·9	77·5
October... ...	29·936	30·140	29·864	91·7	67·5	24·2	89·2	73·0	16·2	81·1	151·7	67·9	84·2	78·9
November	29·856	29·945	29·771	90·5	70·0	20·5	88·1	73·3	14·8	80·7	140·0	69·3	85·2	77·3
December	30·001	30·116	29·971	90·2	69·9	20·3	87·6	72·3	15·3	79·9	138·2	66·7	83·3	74·5
Yearly Sums, Means, and Totals ...	29·979	30·084	29·809	90·3	69·3	21·0	87·6	72·7	14·9	80·1	141·4	67·2	83·5	75·3

Bermuda. Lat. 32° 22′ N.

January	30·060	30·417	29·748	73·0	45·0	28·0	68·5	55·2	13·3	61·8	...	48·7	65·2	60·1
February	30·084	30·429	29·645	72·5	44·5	28·0	67·8	52·5	15·3	60·1	...	45·2	63·6	58·8
March	30·016	30·309	29·659	75·0	43·0	32·0	69·1	54·9	14·2	62·0	123·3	48·2	65·9	61·2
April	30·126	30·391	29·506	77·2	53·0	24·2	73·0	58·7	14·3	65·8	133·9	49·4	69·7	63·9
May	30·009	30·153	29·881	81·8	60·0	21·8	78·7	64·7	14·0	71·7	137·1	56·6	75·4	71·2
June	30·132	30·288	29·970	89·0	64·0	25·0	82·7	68·0	14·7	75·3	143·2	58·0	79·5	72·0
July	30·060	30·265	29·808	88·5	65·0	23·5	85·3	70·3	15·0	77·8	144·8	60·7	81·3	75·5
August... ...	30·112	30·341	29·915	89·2	66·0	23·2	86·3	70·1	16·2	78·2	146·8	62·6	82·7	75·8
September ...	30·030	30·175	29·877	91·0	65·0	26·0	87·2	69·5	17·7	78·3	149·2	63·9	82·8	75·0
October... ...	30·023	30·258	29·864	88·8	57·0	31·8	82·2	66·7	15·5	74·4	138·9	62·7	78·5	72·0
November ...	30·005	30·383	29·601	81·5	49·0	32·5	74·3	58·9	15·4	66·6	123·5	52·3	70·1	62·9
December ...	30·048	30·388	29·5·9	74·0	48·0	26·0	69·6	55·3	14·3	62·4	114·3	47·9	65·6	59·6
Yearly Sums, Means, and Totals ...	30·059	30·316	29·749	81·8	54·9	26·9	77·1	62·1	15·0	69·7	135·5	54·7	73·4	67·3

Newcastle, Jamaica. Lat. 18° 6′ N.

January	26·330	26·454	26·153	85.0	55·0	30·0	78·6	61·3	17·3	69·9	123·0	...	69·4	64·3
February	26·350	26·568	26·311	81·0	53·0	28·0	75·2	61·0	14·2	68·1	117·0	...	66·6	62·6
March	26·367	26·452	26·117	83·0	52·0	31·0	74·1	57·0	17·1	65·6	121·5	...	67·4	61·8
April	26·321	26·413	26·233	85·0	55·0	30·0	79·2	61·5	17·7	70·3	115·7	...	70·0	65 1
May	26·285	26·366	26·233	86·0	57·0	29·0	78·6	62·4	16·2	70·5	112·6	...	70 1	65·7
June	26·344	26·424	26 261	89·0	62·0	27·0	81·5	68·5	13·0	75·0	118·1	...	72·1	67·0
July	26·348	26·394	26·270	87·0	61·0	26·0	82·1	69·0	13·1	75·5	121·3	...	72·7	67·8
August	26·349	26·451	29·294	87·0	69·0	18·0	83·2	72·2	11·0	77·7	120·7	62·3	74·1	68·6
September ...	26·289	26·358	26·208	85·0	57·0	28 0	80·2	64·6	15·6	72·4	114·9	61·4	71·3	67·7
October... ...	26·251	26·356	26·149	82·0	...	...	78·7	...	...	...	119·9	61·4	70·8	67·4
November ...	26·253	26·349	26·154	82·0	...	...	78·3	...	...	...	119·8	60·3	73·6	67·0
December ...	26·298	26 383	26·222	84·0	...	...	77·4	...	...	...	118·3	56·7	69·2	64·9
Yearly Sums, Means, and Totals ...	26·311	26·414	26·211	85 3	57·9	27·4	79·2	64·2	15·0	71·7	118·5	...	70·4	65·8

No. XXVIII—*continued.*

Long. 59° 40′ W. Height above Sea 25 feet.

Hygrometrical Results from Glaisher's Tables.						Atmospherical Conditions.											
		In a Cubic Foot of Air.				Number of Days for mean Direction of Wind.					Calculated from Robinson's Anemometer.					Amount of Rain fall.	
Mean Temperature of Dew Point.	Mean elastic Force of Vapour.	Mean Weight of Vapour.	Mean additional Weight required for Saturation.	Mean Degree of Humidity.	Mean Weight of Cubic Foot of Air.	North.	East.	South.	West.	Number of calm, or nearly calm, Days	Mean daily pressure of Wind.	Mean daily Horizontal Movement of the Air.	Amount of Cloud 0—10.	Ozone Scale 0—10.	Number of Days on which Rain fell.	On the Ground.	32 Feet above the Ground.
											lbs. per sq. foot	Miles				Inches	Inches
67·7	·677	7·2	4·0	63·4	511·5	16·50	14·50	0·00	0·00	0·00	...	220·5	4·9	3·2	14	2·62	2·42
67·5	·674	7·2	3·9	64·9	512·1	15·25	13·50	0·25	0·00	0·00	...	213·8	5·5	3·3	11	0·95	0·87
70·3	·741	8·0	3·6	68·4	509·2	14·50	15·75	0·75	0·00	0·00	...	227·0	4·6	3·3	5	0·47	0·44
66·4	·648	6·9	5·0	57·6	510·1	11·75	15·25	1·75	0·75	0·00*	...	230·4	5·5	3·3	9	0·44	0·39
67·5	·674	7·1	5·3	57·0	508·5	12·50	17·75	0·75	0·00	0·00	...	213·7	5·5	3·4	10	0·32	0·26
70·1	·738	7·8	4·7	62·0	508·0	13·50	16·25	0·25	0·00	0·00	...	239·4	5·2	3·1	15	3·18	2·90
70·2	·739	7·9	4·6	62·3	507·6	11·75	17·50	1·75	0·00	0·00	...	250·3	5·1	3·0	18	5·53	5·03
71·5	·771	8·2	4·3	65·2	507·2	14·50	15·25	1·25	0·00	0·00	...	214·5	5·0	3·3	18	6·57	5·92
72·0	·787	8·3	4·8	63·3	505·0	9·50	15·75	4·75	0·00	0·00	...	164·6	5·2	3·4	10	2·90	2·65
75·4	·880	9·3	3·2	74·8	505·3	7·50	18·00	5·50	0·00	0·00	...	151·8	6·2	3·5	23	11·70	10·44
72·1	·791	8·4	4·5	64·6	504·0	9·25	19·75	1·00	0·00	0·00	...	172·6	4·5	4·0	14	4·70	2·85
68·7	·700	7·4	4·7	51·1	508·9	10·75	19·00	1·25	0·00	6·00	...	175·7	4·6	5·0	11	1·09	0·68
69·9	·735	7·8	4·4	63·7	508·1	147·25	198·25	19·25	0·57	0·00	...	207·0	5·1	3·5	158	40·47	34·85

Long. 64° 40′ W. Height above Sea 61 feet.

																	†
55·9	·448	4·9	1·9	72·5	529·1	7·50	1·50	8·50	12·50	1·00	...	309·0	7·1	3·2	17	3·49	...
54·7	·430	4·8	1·7	73·6	531·2	6·50	6·00	8·00	6·50	2·00	...	252·9	7·5	2·8	17	5·20	...
57·3	·473	5·2	1·8	74·5	527·3	6·50	11·00	7·00	6·50	0·00	...	262·7	7·3	2·9	16	6·90	...
59·4	·533	5·6	2·3	69·7	525·3	5·00	6·50	11·00	5·50	2·00	...	230·1	6·3	2·9	6	0·68	...
68·1	·691	7·4	2·1	78·4	516·4	1·00	5·50	15·50	7·00	2·00	...	314·6	7·7	2·6	14	4·08	...
66·8	·658	7·1	3·7	65·0	514·9	1·50	5·00	14·00	7·50	2·00	...	207·2	5·8	2·8	10	6·39	4·73
71·0	·758	8·1	3·7	68·8	510·5	2·00	3·50	14·00	5·50	6·00	...	208·1	6·0	3·2	10	4·51	2·82
71·2	·764	8·1	3·7	68·4	511·0	7·00	6·50	9·50	4·00	4·00	...	138·4	5·5	3·5	11	9·23	6·02
69·8	·727	7·7	4·2	64·8	509·7	6·50	6·00	5·00	5·50	7·00	...	102·8	5·2	3·1	8	3·60	2·69
67·5	·673	7·2	3·2	69·0	513·7	9·50	9·00	7·50	4·00	1·00	...	211·5	6·0	3·2	15	3·86	2·02
57·3	·472	5·1	2·9	64·2	523·0	8·50	7·50	5·00	7·00	2·00	...	190·7	7·1	3·4	15	4·12	2·49
54·7	·429	4·7	2·2	68·6	528·4	8·00	5·00	5·00	12·00	1·00	...	236·4	7·6	3·4	12	3·72	1·82
62·8	·588	6·3	2·8	69·8	520·0	69·50	73·00	110·00	83·50	30·00	...	222·1	6·6	3·1	151	55·78	...

Long. 76° 42′ W. Height above Sea 3,800 feet.

																	‡
60·3	·522	5·7	2·1	72·9	459·6	0·00	15·50	15·50	0·00	0·00	...	...	2·5	...	0	0·00	0·00
59·4	·507	5·5	1·6	78·0	462·4	1·50	14·25	13·00	0·25	0·00	...	...	4·0	4·5	13	6·14	5·77
57·3	·472	5·1	2·2	70·0	461·0	6·75	14·00	7·25	0·00	3·00	...	...	5·1	4·3	13	5·72	4·88
61·3	·544	5·9	2·0	73·5	458·7	14·75	14·75	0·00	0·00	0·50	...	...	5·9	5·1	13	2·95	2·36
62·3	·564	6·1	1·9	76·1	457·7	15·50	15·50	0·00	0·00	0·00	...	...	7·8	7·5	22	13·98	13·37
63·1	·580	6·3	2·2	73·6	457·0	15·00	15·00	0·00	0·00	0·00	...	...	6·4	7·1	11	11·72	10·63
64·1	·601	6·5	2·2	75·2	456·3	15·50	15·50	0·00	0·00	0·00	...	...	6·1	7·0	10	6·13	4·56
64·5	·609	6·6	2·5	72·0	455·3	15·50	15·50	0·00	0·00	0·00	...	...	5·4	6·9	9	3·75	3·41
64·9	·617	6·7	1·6	80·0	456·2	15·00	15·00	0·00	0·00	0·00	...	...	7·9	7·0	21	9·57	8·78
64·8	·614	6·7	1·5	81·0	456·2	15·50	15·50	0·00	0·00	0·00	...	...	8·2	6·9	22	11·13	10·30
64·3	·603	6·6	1·6	80·0	456·4	15·00	15·00	0·00	0·00	0·00	...	...	7·3	7·0	21	31·00	29·30
61·6	·545	6·0	1·8	76·7	458·9	15·50	15·50	0·00	0·00	0·00	...	...	5·6	6·5	15	12·61	11·01
62·3	·565	6·1	1·9	75·7	457·9	145·50	151·00	35·75	0·25	3·50	...	...	6·0	6·3	170	114·68	103·70

* 0·50 days in April short. † 20 feet above the ground. ‡ 35 feet above the ground.

UP PARK CAMP, JAMAICA. Lat. 17° 59′ N.

Month.	Readings of the Barometer.			Temperature of the Air.*							Mean Daily Readings of			
	Mean reduced and corrected to 32°.	Highest reduced and corrected to 32°.	Lowest reduced and corrected to 32°.	Highest during Month.	Lowest during Month.	Range during Month.	Mean.				Maximum in Sun's Rays.	Minimum on Grass.	Hygrometer	
							Of all the highest.	Of all the lowest.	Daily Range.	Approximate Temperature.			Dry Bulb.	Wet Bulb.
January	29·786	29·906	29·695	97·0	61·0	36·0	94·0	65·0	29·0	79·5	...	52·9	83·5	72.4
February	29·804	29·891	29·721	97·0	60·0	37·0	91·3	65·0	26·3	78·1	...	55·1	81·6	73·4
March	29·778	29·884	29·669	...	62·0	...	...	66·4	...	...	...	60·3	82·5	75·0
April	29·809	29·891	29·714	...	61·0	...	...	68·8	...	...	...	54·4	83·4	74·8
May	29·766	29·871	29·693	...	67·0	...	...	70·4	...	...	...	58·3	83·8	77·3
June	29·790	22·893	29·702	...	70·0	...	...	72·0	...	...	131·0	64·6	85·6	75·9
July	29·765	29·877	29·703	...	69·0	...	...	72·9	...	...	137·8	64·5	87 8	78·1
August	29·779	29·885	29·687	...	70·0	...	...	72·3	...	...	139·6	64·3	88·7	79·7
September	29·743	29·837	29·627	105·0	66·0	39·0	99·3	69.9	29·4	84·6	142 0	65·8	86·9	77·1
October...	29·703	29·822	29·592	105·0	64·0	41·0	96·4	68·1	28·3	82·2	139·6	66·1	83·7	76·6
November	29·713	29·853	29·579	107·0	63·0	44·0	98·2	66·7	31 5	82·4	135·9	61·4	83·7	76·2
December	29·785	30·382	29·404	104·0	62·0	42·0	97·8	65·8	32·0	81·8	...	65·1	83·6	74·4
Yearly Sums, Means, and Totals ...	29·768	29·916	29·649	102·5	62·7	39·8	96·2	66·7	29·4	81·4	137·6	61·0	84·6	75·9

BELGAUM. Lat. 15° 52′ N.

January	27·389	27·550	27 ·192	93 ·2	56 ·0	37 ·2	91 ·4	57 ·0	34 ·4	74 ·2	129 ·1	55 ·8	76 ·1	65 ·1
February	27·374	27·531	27·228	97·5	55·8	41·7	91·6	60·1	31·5	75·8	131·1	56·5	79·4	66·5
March	27·350	27·469	27·221	101·1	59·0	42·1	97.3	63·6	33·7	80·4	137·3	57·8	83·4	68·4
April	27·320	27·489	27·210	105·1	61·4	43·7	99·2	67·6	31·6	83·4	...	65·5	86·2	71·7
May	27·300	27·461	27 ·130	103·2	64·2	39·0	98·0	67·2	30·8	82·6	...	70·0	84·8	73 0
June	27·235	27·392	26·943	97·8	65·2	32·6	85·5	67·9	17·6	76·7	...	67·2	75·3	71·9
July	27·249	27·369	27·154	92·5	64·0	28·5	82·1	66·1	16 0	74·1	...	64·9	73·5	70·4
August...	27·285	27·339	27·155	86·7	62·0	24·7	81·4	65 2	16·2	73·3	...	64·2	73·1	69·8
September	27·310	27·429	27·209	92·4	61·2	31·2	86·5	64·1	22·4	75·3	...	62·7	75·5	70 5
October...	27·346	27·443	27 244	95·7	61·2	34·5	93·3	64·9	28·4	79·6	...	61·9	78·5	69·4
November	27·388	27·599	27·240	94·0	53·1	40·9	90·9	59·0	31·9	74·9	...	54·0	77·4	63·8
December	27·426	27·554	27·323	92·5	53·6	38·9	89·2	57·6	31·6	73·4	...	49·4	76·5	64·5
Yearly Sums, Means, and Totals ...	27·331	27·469	27·187	96·0	59·7	36·2	90·5	63·3	27·2	76·9	...	60·8	78·3	68·7

BOMBAY. Lat. 18° 54′ N.

January For 26 days only	29·947	30·063	29·779	85·4	61·4	24·0	79·7	66·7	13·0	73·2	114·1	64·2	76·7	68·4
February 24 ,,	29·926	30·065	29·746	88·4	64·3	24·1	81·5	69·2	12·3	75·3	122·0	67·0	78·3	71·1
March 25 ,,	29·884	30·001	29·756	85·4	64·4	21·0	82·0	71·2	10·8	76·6	123·0	69·1	80·2	71·4
April 25 ,,	29·833	30·046	29·714	89·4	72·2	16·5	86·8	77·2	9·6	82·0	137·2	74·7	85·3	76·9
May 25 ,,	29·800	29·933	29·598	90·4	76·4	14·0	89·4	80·5	8·9	84·9	138·4	78·0	87·9	79·6
June 26 ,,	29·673	29·823	29·399	92·4	76·5	15·9	87·0	79·6	7·4	83·3	114·4	77·3	85·2	80·1
July 27 ,,	29·,01	29·861	29·577	88·0	74·0	14·0	83·7	77·1	6·6	80·4	110·3	75·7	81·9	78·3
August 25 ,,	29·747	29·906	29·551	85·8	74·5	11·3	83·3	77·9	5·4	80·6	106·6	75·4	81·4	77·7
September 26 ,,	29·819	29·829	29·706	87·5	74·8	12·7	84·3	76·9	7·4	80·6	121·4	75·3	82·5	77·9
October 26 ,,	29·815	29·975	29·746	90·6	74·0	16·6	87·2	76·6	10·6	81·9	128·1	74·7	84·7	78·4
November 25 ,,	29·925	30·089	29·739	89·8	70·3	19·5	86·5	72·8	13·7	79·6	125·1	69·6	82·6	73·5
December 26 ,,	29·963	30·129	29·825	88·9	66·9	22·0	83·4	70·0	13·4	76·7	118·5	67·1	79·4	70·8
Yearly Sums, Means, and Totals† ...	29·836	29·985	29·678	88·5	70·9	17·6	84·6	74·6	10·0	79·6	121·6	72·3	82·2	75·3

* For six months only. † 306 days.

No. XXVIII—*continued.*

Long 76° 56′ W. Height above Sea 225 feet.

Hygrometrical Results from Glashier's Tables.						Atmospherical Conditions.										
		In a Cubic Foot of Air.				Number of Days for mean Direction of Wind.					Calculated from Robinson's Anemometer.					
Mean Temperature of Dew Point.	Mean elastic Force of Vapour	Mean Weight of Vapour.	Mean additional Weight required for Saturation.	Mean Degree of Humidity.	Mean Weight of Cubic Foot of Air.	North.	East.	South.	West.	Number of calm, or nearly calm, Days.	Mean daily pressure of Wind.	Mean daily Horizontal Movement of the Air.	Amount of Cloud 0—10.	Ozone Scale 0—10.	Number of Days on which Rain fell.	Amount of Rain fall.*
																On the Ground. / 30 Feet above the Ground.
											lbs. per sq. foot	Miles				Inches / Inches
65·0	·618	6·5	5·6	53·7	505·6	5·25	13·75	11·50	0·50	0·00	...	38·2	4·1	4·1	1	0·92 / 0·59
67·9	·682	7·3	4·2	63·8	507·2	6·50	12·50	8·00	2·00	0·00	...	79·9	3·3	4·0	7	3·75 / 2·52
70·0	·733	7·8	4·0	66·0	505·6	4·50	15·50	11·00	0·00	0·00	...	78·5	2·8	3·4	2	0·48 / 0·30
69·1	·711	7·5	4·6	62·0	505·3	4·00	15·00	11·00	0·00	0·00	...	79·5	3·8	4·0	7	2·21 / 1·34
73·0	·811	8·6	3·7	70·0	503·7	0·50	15·00	15·00	0·50	0·00	...	61·1	3·8	3·9	5	7·31 / 7·28
69·6	·724	7·6	5·4	58·9	504·2	3·00	15·00	12·00	0·00	0·00	...	105·5	3·6	4·5	9	4·13 / 3·06
71·9	·783	8·2	5·7	59·0	500·2	1·25	15·50	14.00	0.25	0·00	...	113·9	3·8	3·7	4	0·84 / 0·61
74·0	·838	8·8	5·5	61·7	499·2	3·25	15·25	12·25	0·25	0·00	...	92·3	3·5	5·0	3	2·21 / 1·29
70·8	·755	7·9	5·6	58·6	500·9	9·00	13·50	6·75	0·75	0·00	...	73·7	4·8	4·0	10	4·44 / 2·84
71·9	·782	8·3	4·0	67·6	502·9	4·50	14·50	11·00	1·00	0·00	...	84·6	4·9	4·6	14	11·10 / 7·19
71·2	·764	8·1	4·1	66·0	503·2	9·50	14·50	6·00	0·00	0·00	...	67·6	4·2	4·5	10	9·30 / 7·04
68·3	·692	7·3	4·9	59·8	505·0	4·00	15·00	11·25	0·75	0·00	...	88·1	3·9	4·6	5	3·42 / 2·71
70·2	·741	7·8	4·8	62·3	503·5	55·25	175·0	29·75	6·00	0·00	...	80·2	3·9	4·2	77	50·11 / 36·77

Long. 74° 42′ E. Height above Sea 2,260 feet.

57·3	·470	5·1	4·6	52·0	472·2	0·00	15·25	14·00	1·75	0·00	...	...	2·3	0·7	...	... / ...
57·6	·476	5·1	5·6	47·3	469·2	3·75	9·50	5·00	10·75	0·00	...	...	1·6	0·5	...	... / ...
58·4	·490	5·2	7·0	42·4	465·4	5·75	9·00	9·00	7·25	0·00	...	...	2·3	2·4	3	0·74 / 0·68
62·3	·562	6·0	7·3	44 9	462·0	8·00	5·25	7·50	9·25	0·00	...	...	3·1	3·4	3	2·61 / 2·51
65·2	·625	5·9	6·1	51·6	462·5	8·75	1·75	2·75	17·75	0·00	...	...	3·8	4·1	6	5·86 / ...
69·4	·721	7·8	1·7	82·3	468·6	1·50	1·25	17·00	9·75	0·50	...	...	6·9	7·2	25	16·93 / ...
68·1	·679	7·5	1·5	83·5	470·6	0·00	0·00	14·75	16·25	0·00	...	...	7·5	7·7	23	11·34 / 9·81
67·4	·670	7·3	1·4	82·6	471·8	0·00	0·00	9·00	22·00	0·00	...	...	7·7	6·2	22	14·74 / 12·07
64·9	·661	7·1	2·4	74·5	470·3	0·00	0·00	4·25	25·75	0·00	...	...	6·7	4·8	11	1·42 / 1·29
63·1	·578	6·3	4·2	59·1	468·7	2·75	20·25	2·75	5·25	0·00	...	...	5·0	2·8	9	2·80 / 2·61
54·3	·423	4·5	5·3	45·6	471·4	0·25	28·25	1·50	0·00	0·00	...	...	2·7	1·1	...	... / ...
56·0	·450	4·9	4·9	49·0	472·5	0·00	25·25	4·75	1·00	0·00	...	...	2·7	1·6	...	... / ...
62·0	·567	6·0	4·3	59·5	468·8	30·75	115·75	92·25	126·75	0·50	...	...	4·3	3·5	102	56·44 / ...

Long. 72° 49′ E. Height above Sea 37·5 feet.

62·6	·567	6·1	3·8	62·5	515·0	9·50	4·50	0·50	10·00	1·50	...	...	1·4	...	...	... / ...
66·1	·642	6·9	3·5	66·5	512·6	9·25	6·25	0·50	8·00	0·00	...	...	2·7	...	...	... / ...
65·4	·625	6·7	4·3	60·0	510 3	10·75	3·75	1·25	9·25	0·00	...	...	0·8	..	1	0·01 / ...
71·4	·771	8·2	4·7	62·8	503·7	8·50	2·00	2 00	12·00	0·50	...	...	2·0	...	...	... / ...
74·3	·849	8·9	5·0	63·8	502·6	1·25	0·75	5·00	16·50	1·50	...	...	4·2	...	...	... / ...
76·7	·923	9·7	2·2	75·6	500·3	0·25	1·00	10·00	14·25	0·50	...	...	8·4	...	29	13·88 / 11·55
75·9	·894	9·5	2·2	85·3	503·8	0·00	0·50	7·25	19·25	0·00	...	...	8·2	...	28	20·98 / 18·02
75·2	·875	9·3	2·2	81·9	505·1	0·00	0·00	10·25	14·75	0·00	...	...	9·0	...	26	20·83 / 18·14
74·8	·863	9·2	2·6	77·6	505·4	0·25	1·75	3·25	19·75	1·00	...	...	7·0	...	21	7·91 / 7·35
74·3	849	9·0	3·7	70·8	503·5	5 00	9·00	1·75	10·25	0·00	...	...	5·0	...	1	0·14 / 0·14
67·4	·672	7·2	4·7	60·2	508·4	5·75	8·00	0 00	11·25	0·00	...	...	2·5	...	1	0·02 / 0·10
64·8	·615	6·6	4·1	61·0	512·4	10·25	7·00	0·00	8·75	0·00	...	...	2·8	...	...	... / ...
70·7	·762	8·1	3·6	69·0	506·9	60·75	44·50	41·75	154·00	5·00	...	...	4·5	...	107	63·77 / 55·21

* The amount of rain which fell has been recorded for 366 days; all the other observations extend only over 306 days.

Appendix

DEESA. Lat. 24° 12′ N.

Month.	Readings of the Barometer.			Temperature of the Air.							Mean Daily Readings of			
	Mean reduced and corrected to 32°.	Highest reduced and corrected to 32°.	Lowest reduced and corrected to 32°.	Highest during Month.	Lowest during Month.	Range during Month.	Mean				Maximum in Sun's rays.	Minimum on Grass.	Hygrometer.	
							Of all the highest.	Of all the lowest.	Daily Range.	Approximate Temperature.			Dry Bulb.	Wet Bulb.
January	...	...	...	...	...	...	...	...	...	...	...	...	...	...
February For 19 days	29·657	29·827	29·514	99·6	51·0	48·6	88·1	61·6	26·5	74·8	145·4	54·2	82·1	63·6
March	29·617	29·740	29·445	101·7	46·0	55·7	92·4	62·2	30·2	77·3	154·9	53·5	85·1	62·9
April	29·528	29·765	29·357	111·5	70·9	40·6	101·5	75·1	26·4	88·3	171·3	64·3	93·1	70·8
May	29·460	29·619	29·293	113·1	67·6	45·5	108·6	79·7	28·9	94·1	Thermometer broken	69·9	99·9	74·5
June	29·283	29·442	29·029	112·8	79·0	33·8	110·9	83·1	27·8	97·0		80·2	93·6	78·2
July	29·315	29·479	29·187	104·1	77·2	26·9	97·7	81·3	16·4	89·5		77·3	90·3	77·5
August	29·340	29·524	28·991	96·3	75·3	21·0	89·9	75·3	14·6	82·6		75·0	83·9	76·3
September	29·482	29·644	29·339	102·0	73·0	29·0	94·5	76·1	18·4	85·3		73·1	87·5	75·1
October	29·601	29·755	29·430	102·2	62·0	40·2	98·2	70·8	27·4	84·5		65·3	90·3	68·9
November	29·647	29·867	29·505	99·3	55·3	44·0	93·1	60·6	32·5	76·8		56·8	84·8	64·4
December	29·745	29·919	29·568	89·6	48·0	41·6	85·0	54·5	30·5	69·7		49·4	77·1	59·7
Yearly Sums, Means, and Totals ...	29·516	29·689	29·333	102·9	64·1	38·8	96·3	70·9	25·4	83·6	157·2	65·2	88·0	70·2

KURRACHEE. Lat. 24° 47′ E.

January	...	...	...	...	...	...	...	...	...	...	...	...	...	...
February	...	...	...	...	...	...	...	...	...	...	...	...	...	...
From 18th inclusive—														
March (14 days) ...	30·128	30·212	29·956	99·9	70·0	29·9	94·6	74·5	20·1	84·5	124·0	58·9	86·4	74·8
April	30·000	30·203	29·873	99·2	72·4	26·8	92·7	78·7	14·0	85·7	126·7	62·8	88·4	78·2
May	29·913	30·085	29·741	109·8	74·0	35·8	99·1	82·6	16·5	90·8	129·0	69·2	93·4	83·3
June	29·695	29·839	29·539	117·8	76·0	41·8	100·2	82·2	18·0	91·2	127·9	72·2	95·7	86·3
July	29·742	29·897	29·615	97·4	74·2	23·2	95·6	78·3	17·3	86·9	122·3	76·3	91·3	84·3
August	29·784	29·957	29·606	99·8	76·2	23·6	94·6	79·6	15·0	87·1	117·1	78·6	89·8	82·0
September	29·958	30·098	29·790	100·2	75·0	25·2	93·7	77·4	16·3	85·5	114·2	75·5	88·7	80·7
October	30·060	30·201	29·867	108·8	59·1	49·7	98·5	70·4	28·4	84·3	123·0	68·8	92·2	78·7
November	30·169	30·327	29·666	110·2	61·7	48·5	97·6	65·6	32·0	81·6	115·6	64·4	89·8	76·8
December	30·225	30·468	30·009	101·8	45·6	56·2	91·9	57·8	34·1	74·8	100·9	56·0	80·9	66·6
Yearly Sums, Means, and Totals ..	29·970	30·129	29·766	104·5	68·4	36·1	95·8	74·7	21·1	85·2	119·9	68·3	89·6	79·2

POONA. Lat. 18° 28′ N.

January	27·949	28·084	27·769	86·7	58·0	28·7	81·7	63·1	18·6	72·4	130·6	56·8	74·8	64·2
February	27·934	28·102	27·756	93·0	57·4	35·6	85·7	65·9	19·8	75·8	136·8	58·5	78·3	64·8
March	27·882	28·020	27·762	96·0	57·4	38·6	89·8	69·0	20·8	79·4	140·9	60·5	79·2	66·1
April	27·833	28·045	27·711	104·7	69·8	34·9	96·9	78·2	18·7	87·5	149·3	69·5	90·3	70·5
May	27·809	27·931	27·624	103·4	72·0	31·4	96·8	77·4	19·4	87·1	150·6	71·1	90·0	72·3
June	27·698	27·849	27·352	96·4	70·0	26·4	85·0	73·7	11·3	79·3	134·7	70·5	80·3	74·5
July	27·726	27·866	27·631	88·4	69·9	18·5	81·6	71·9	9·7	76·7	129·8	69·3	77·8	72·4
August	27·753	27·914	27·578	83·8	69·8	14·0	79·4	71·0	8·4	75·2	126·4	68·8	76·0	71·5
September	27·821	27·934	27·699	84·6	69·2	15·6	81·8	71·0	10·8	76·4	135·3	68·4	78·0	71·7
October	27·890	28·011	27·754	89·8	68·4	21·4	86·6	71·1	15·5	78·8	143·0	67·0	81·3	70·0
November	27·952	28·113	27·768	90·3	62·4	27·9	85·1	65·6	19·5	75·3	137·3	58·9	78·3	63·2
December	27·929	28·127	27·801	85·7	60·2	25·5	82·7	63·0	19·7	72·8	132·5	56·7	75·4	61·8
Yearly Sums, Means, and Totals ...	27·848	27·999	27·684	91·9	65·4	26·5	86·1	70·1	16·0	78·1	137·3	64·7	79·9	68·6

No. XXVIII—*continued.*

Long. 72° 17′ E. Height above Sea 408 feet.

Hygrometrical Results from Glaisher's Tables.						Atmospherical Conditions.											
		In a Cubic Foot of Air.				Number of Days for mean Direction of Wind.					Calculated from Robinson's Anemometer.					Amount of Rain fall.	
Mean Temperature of Dew Point.	Mean elastic Force of Vapour.	Mean Weight of Vapour.	Mean additional Weight required for Saturation.	Mean Degree of Humidity.	Mean Weight of Cubic Foot of Air.	North.	East.	South.	West.	Number of calm, or nearly calm, Days.	Mean daily pressure of Wind.	Mean daily Horizontal Movement of the Air.	Amount of Cloud 0—10.	Ozone Scale 0—10.	Number of Days on which Rain fell.	On the Ground.	22 Feet above the Ground.
											lbs. per sq. foot	Miles				Inches	Inches
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..
51·2	·377	4·0	7·7	34·0	506·2	6·25	3·00	2·75	7·00	0·00	...	...	3·3	...	...	...	..
48·4	·340	3·6	19·3	27·8	504·0	8·75	3·50	4·25	14·50	0·00	...	...	1·6	...	} No rain guage.		
57·2	·469	4·9	11·3	29·7	493·9	5·00	0·75	1·75	22·50	0·00	...	...	2·6	...			
60·0	·518	5·3	14·4	28·6	486·2	2·00	0·25	8·75	20·00	0·00	...	...	0·8	...			
68·9	·705	7·3	8·5	44·4	487·6	0·75	2·00	16·75	10·00	0·50	...	...	6·6	4·1	6	4·01	3·64
69·5	·720	7·5	7·4	52·1	490·9	0·00	0·25	17·25	11·50	2·00	...	..	6·5	2·6	4	1·72	1·56
71·3	·767	8·1	4·2	65·6	496·8	1·25	0·75	10·25	17·25	1·50	...	...	0·7	3·0	11	11·94	15·86
67·2	·666	7·0	6·8	50·2	496·6	0·25	0·00	6·00	23·25	0·50	...	...	0·4	1·6	2	0·05	0·16
55·4	·440	4·6	10·4	31·4	497·4	3·75	5·75	8·25	11·75	1·50	...	...	0·1	0·0	1	1·06	1·27
51·0	·375	4·0	8·7	31·2	503·5	7·25	6·50	5·50	8·75	2·00	...	...	0·1	0·5	...	...	...
47·5	·329	3·5	6·4	35·2	512·7	10·75	12·75	1·75	5·25	0·50	...	...	0·1	0·8	...	...	...
58·9	·519	5·4	8·6	39·1	497·8	46·00	35·50	83·25	151·75	8·50	...	...	2·1	...	...	...	...

Long. 67° 3′ E. Height above Sea 40 feet.

...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
67·3	·669	7·0	6·4	53·6	508·2	0·75	2·50	1·50	9·25	0·00	...	...	6·0	...	...	...	...
71·7	·785	8·1	5·6	57·4	503·7	0·50	1·25	9·00	19·25	0·00	...	...	6·5	...	...	...	...
77·2	·932	10·0	6·7	59·7	497·4	0·50	0·25	14·00	16·25	0·00	...	...	3·5	...	...	...	...
81·4	1·048	10·9	6·6	61·8	490·4	0·50	1·00	12·00	16·50	0·00	...	...	6·5	...	2	0·19	...
80·0	1·024	10·7	4·7	70·0	495·3	0·00	0·00	13·00	18·00	0·00	...	...	8·0	...	4	1·26	...
77·1	·932	9·8	4·9	65.8	497·9	0·00	0·00	10·25	20·75	0·00	...	...	7·5	...	4	0·80	...
75·6	·886	9·3	5·0	65·7	501·9	0·00	0·00	13·75	16·25	0·00	...	...	6·5	...	2	0·02	...
70·4	·744	7·8	7·9	48·7	503·8	0·00	3·50	14·75	12·75	0·00	...	...	3·0	...	...	...	...
68·7	·699	7·3	7·4	49·8	505·7	3·75	6·00	14·50	5·75	0·00	...	...	2·5	...	1	0·46	...
57·0	·463	5·0	6·3	44·0	516·4	8·00	12·75	7·25	3·00	0·00	...	...	3·0	...	2	0·83	...
72·6	·818	8·6	6·1	57·6	502·0	14·00	27·25	110·00	137·75	0·00	...	...	5·3	...	15	3·56	...

Long. 74° 10′ E. Height above Sea 1,850 feet.

56·6	·459	5·0	4·4	53·2	483·1	7·00	4·75	15·25	4·00	0·00	...	...	2·0	3·0	...	...	...
55·5	·441	4·7	5·7	45·5	479·8	8·50	6·50	2·75	11·25	0·00	...	...	2·0	0·5	...	...	...
57·0	·467	5·0	5·7	46·7	478·2	9·75	4·75	1·75	14·75	0.00	...	...	2·0	0·7	2	1·35	1·12
58·1	·484	5·1	9·8	34·4	467·8	12·50	2·25	1·00	14·25	0·00	...	...	3·0	0·4	...	...	...
61·2	·540	5·5	9·1	38·6	467·2	11·25	1·75	1·00	17·00	0·00	...	...	4·0	0·8	2	1·16	0·91
70·6	·749	8·0	3·1	71·8	472·1	14·75	1·25	6·75	7·25	0·00	...	...	8·0	2·6	24	13·65	10·92
68·6	·701	7·8	2·7	73·4	475·3	3·50	0·00	7·25	20·25	0·00	...	...	7·5	3·1	19	5·85	4·64
68·3	·692	7·4	2·2	77·0	477·1	4·00	0·00	5·00	23·00	0·00	...	...	7·5	4·4	17	9·48	7·78
67·3	·669	7·2	3·1	69·8	477·8	9·50	0·00	0·00	20·50	0·00	...	...	6·0	2·5	6	5·57	4·56
62·4	·563	6·0	5·4	52·1	475·8	13·75	10·50	2·75	4·00	0·00	...	...	3·0	1·1	2	1·08	0·81
52·8	·402	4·3	6·1	41·0	480·5	2·25	27·75	0·00	0·00	0·00	...	...	1·0	0·3	...	...	...
52·0	·389	4·2	5·3	41·6	482·6	0·00	18·00	7·50	5·50	0.00	...	...	1·1	0·3	...	...	...
60·9	·546	5·8	5·2	53·8	476·4	95·75	77·50	51·00	141·75	0·00	...	...	3·9	1·6	72	38·14	30·74

COLOMBO, CEYLON. Lat. 6° 56′ N.

Month.	Readings of the Barometer.			Temperature of the Air.							Mean Daily Readings of			
	Mean reduced and corrected to 32°.	Highest reduced and corrected to 32°.	Lowest reduced and corrected to 32°.	Highest during Month.	Lowest during Month.	Range during Month.	Mean. Of all the highest.	Mean. Of all the lowest.	Mean. Daily Range.	Mean. Approximate Temperature.	Maximum in Sun's rays.	Minimum on Grass.	Hygrometer. Dry Bulb.	Hygrometer. Wet Bulb.
January	...	...	...	102·0	68·0	32·0	94·7	74·5	20·2	84·6	141·5	75·6	82·7	75·5
February	...	...	...	97·0	72·0	25·0	95·8	75·3	20·5	85·5	139·6	70·8	83·7	72·2
March	...	...	...	102·0	68·0	34·0	96·4	73·6	22·8	85·0	...	...	84·3	74·7
April	...	...	...	100·0	72·0	28·0	98·2	74·9	23·3	86·5	...	...	85·1	74·5
May	...	...	...	104·0	71·0	33·0	97·1	74·9	22·2	86·0	...	...	85·1	77·6
June	...	...	...	98·8	65·8	33·0	91·8	76·3	15·5	83·0	...	...	85·1	80·0
July	...	...	...	99·0	70·0	29·0	93·2	72·2	21·0	82·7	...	...	82·4	76·6
August	...	...	...	99·0	70·0	29·0	93·6	72·5	21·1	83·0	...	...	83·0	72·8
September	...	...	...	98·0	70·0	28·0	93·9	70·9	23·0	82·4	...	...	82·6	74·0
October	...	...	...	99·0	70·0	29·0	95·4	71·2	24·2	83·3	...	...	82·4	75·3
November	...	...	...	103·0	69·0	34·0	97·4	71·2	26·2	84·3	...	...	85·1	72·9
December	...	...	...	101.0	70·0	31·0	95·2	73·3	21·9	84·2	...	...	85·4	75·2
Yearly Sums, Means, and Totals ...	...	...	...	100·2	69·6	30·6	95·2	73·4	21·8	84·2	...	...	83·9	75·1

KANDY, CEYLON. Lat. 7° 18′ N.

January	...	...	...	94·0	57·2	36·8	89·0	62·2	26·8	75·6	...	...	80·2	72·3
February	...	...	...	98·0	52·2	45·8	93·5	61·8	31·7	77·6	...	...	82·2	72·1
March	...	...	...	98·4	56·6	41·8	86·2	67·6	18·6	76·9	...	...	84·4	73·8
April	...	...	...	100·6	62·0	38·6	97·0	65·0	32·0	81·0	...	...	84·3	75·4
May	...	...	...	104·2	63·0	41·2	98·2	65·5	32·8	81·8	...	...	84·2	75·2
June	...	...	...	98·4	62·0	36·4	91·7	65·3	26·4	78·5	...	...	81·4	74·4
July	...	...	...	93·0	62·0	31·0	87·7	64·1	23·6	75·9	...	...	78·0	72·5
August	...	...	...	93·0	61·0	32·0	88·7	65·4	23·3	77·0	...	...	79·5	73·4
September	...	...	...	96·0	62·0	34·0	91·1	65·2	25·9	78·1	...	...	80·6	73·9
October	...	...	...	100·2	61·0	39·2	94·3	64·3	30·0	79·3	...	...	81·6	74·9
November	...	...	...	100·4	54·0	46·4	92·3	61·9	30·4	77·1	...	...	77·8	72·1
December	...	...	...	94·2	55·6	38·6	88·9	62·9	26·0	75·9	...	...	77·2	71·8
Yearly Sums, Means, and Totals ...	...	...	...	97·5	59·0	38·5	91·5	64·3	27·2	77·9	...	...	80·9	73·5

NEWERA ELLIA, CEYLON. Lat. 6° 48′ N.

January	...	...	...	83·0	18·9	64·1	72·7	37·3	35·4	55·0	137·9	30·6	61·4	55·9
February	...	...	...	88·0	44·0	44·0	78·4	35·4	43·0	56·9	138·6	27·1	66·0	58·0
March	...	...	...	81·2	26·3	54·9	76·8	39·5	37·3	58·1	135·4	33·0	67·5	60·2
April	...	...	...	81·2	30·0	51·2	77·4	39·1	38·3	58·2	135·4	31·1	68·7	61·3
May	...	...	...	82·4	30·6	51·8	79·2	41·7	37·5	60·4	134·5	35·5	70·4	62·9
June	...	...	...	77·6	36·4	41·2	72·1	49·0	23·1	60·5	125·2	40·6	63·6	58·9
July	...	...	...	81·4	40·6	40·8	72·1	48·7	23·4	60·4	122·2	40·7	63·9	59·2
August	...	...	...	79·0	34·0	45·0	71·4	47·3	24·1	59·3	123·8	38·8	63·6	58·2
September	...	...	...	77·2	38·6	38·6	71·6	47·5	24·1	59·5	128·0	39·0	63·4	58·6
October	...	...	...	80·0	38·0	42·0	75·8	43·9	31·9	59·8	136·5	34·0	67·2	61·8
November	...	...	...	83·0	40·0	43·0	75·0	47·7	27·3	61·3	134·9	39·2	65·4	60·0
December	...	...	...	78·2	32·6	46·2	72·4	43·1	29·3	57·7	123·5	40·4	63·6	58·8
Yearly Sums, Means, and Totals ...	...	...	...	81·0	34·1	46·9	74·6	43·3	31·3	58·9	131·3	35·8	65·4	59·5

No. XXVIII—*continued.*

Long. 79° 49′ E. Height above Sea 18 feet.

Hygrometrical Results from Glashier's Tables.						Atmospherical Conditions.											
Mean Temperature of Dew Point.	Mean elastic Force of Vapour.	In a Cubic Foot of Air.			Mean Weight of Cubic Foot of Air.	Number of Days for mean Direction of Wind.				Number of calm, or nearly calm, Days.	Calculated from Robinson's Anemometer.		Amount of Cloud 0—10.	Ozone Scale 0—10.	Number of days on which Rain fell.	Amount of Rain fall.	
		Mean Weight of Vapour.	Mean additional Weight required for Saturation.	Mean degree of Humidity.		North.	East.	South.	West.		Mean daily pressure of Wind.	Mean daily Horizontal Movement of the Air.				On the Ground.	18 Feet above the Ground.
											lbs. per sq. foot	Miles.				Inches	Inches
70·7	·751	8·0	3·9	67·2	...	17·00	11·00	1·75	1·25	0·00	...	302·8	2·3	5·2	11	13·24	11·08
64·6	·609	6·4	5·8	52·5	...	7·00	11·25	9·75	1·00	0·00	...	350·5	1·7	5·3	1	1·01	0·75
68·4	·695	7·3	5·2	58·2	...	4·50	22·75	3·75	0·00	0·00	...	...	3·0	5·1	3	0·04	0·01
67·6	·677	7·2	5·5	56·2	...	0·00	1·00	23·00	6·00	0·00	...	...	1·4	5·0	2	2·55	2·01
72·7	·806	8·5	4·3	66·1	...	0·00	6·75	17·75	6·50	0·00	...	...	1·8	5·5	8	25·52	22·08
76·6	·920	9·7	3·1	75·6	...	0·00	0·00	13·75	16·25	0·00	...	...	4·6	5·0	6	4·10	3·78
72·7	·804	8·6	3·2	72·8	...	0·00	2·50	24·00	4·50	0·00	...	...	1·5	5·6	3	4·57	3·17
66·0	·639	6·8	5·8	56·4	...	0·00	2·50	24·00	4·50	0·00	...	...	1·6	3·4	4	7·51	6·52
68·2	·691	7·4	4·5	62·2	...	0·00	4·50	15·00	10·50	0·00	...	...	1·5	5·5	8	7·13	5·72
70·6	·748	8·0	3·8	67·6	...	1·25	1·25	14·50	14·00	0·00	...	...	1·5	5·1	13	24·72	20·27
65·1	·618	6·5	6·3	51·4	...	10·00	10·00	5·00	5·00	0·00	...	...	1·4	5·2	4	11·82	10·23
68·6	·699	7·4	5·5	57·4	...	8·50	8·75	7·00	6·75	0·00	...	...	1·8	5·3	8	12·08	11·26
69·3	·721	7·7	4·7	61·9	...	48·25	82·25	159·25	76·25	0·00	...	...	2·0	5·1	71	114·29	94·88

Long. 80° 48′ E. Height above Sea 1,678 feet.

66·9	·659	7·1	4·0	63·6	...	13·00	13·00	1·50	1·50	2·00	...	...	4·7	2·4	10	9·25	...
65·3	·625	6·7	5·1	56·7	...	12·25	12·25	1·50	1·50	1·50	...	...	2·4	2·8	4	2·46	...
66·8	·659	7·0	5·6	55·2	...	11·25	11·25	3·25	3·25	2·00	...	...	2·9	2·6	5	3·28	...
69·5	·723	7·7	4·8	60·7	...	6·75	6·75	5·50	5·50	5·50	...	...	4·5	2·8	5	1·21	...
69·3	·716	7·6	4·9	60·2	...	1·75	1·75	12·50	12·50	2·50	...	...	4·4	3·1	10	3·00	...
69·7	·726	7·7	3·7	68·0	...	0·00	0·00	14·00	14·00	2·00	...	...	5·8	3·4	14	9·82	...
68·6	·701	7·5	2·7	73·0	...	0·00	0·00	13·75	13·75	3·50	...	...	5·3	3·5	19	5·88	...
69·2	·715	7·6	3·1	70·6	...	0·00	0·00	15·00	15·00	1·00	...	...	4·6	3·2	8	1·91	...
69·4	·719	7·6	3·5	68·2	...	0·00	0·00	13·25	13·25	3·50	...	...	5·8	3·1	12	6·13	...
70·4	·744	8·0	3·5	69·2	...	3·50	3·50	7·25	7·25	3·50	...	...	5·5	3·3	20	8·91	...
68·1	·688	7·4	2·8	72·2	...	11·00	11·00	2·75	2·75	2·50	...	...	5·0	3·4	16	6·06	...
68·0	·686	7·4	2·7	73·4	...	14·00	14·00	0·00	0·00	3·00	...	...	5·6	3·6	3	8·92	...
68·4	·699	7·4	3·9	65·9	...	73·50	73·50	90·25	90·25	38·00	...	...	4·7	3·1	126	66·33	...

Long. 80° 48′ E. Height above Sea 6,200 feet.

51·2	·376	4·2	1·8	69·9	...	0·00	22·50	8·50	0·00	0·00	...	...	6·9	3·8	8	2·98	...
51·5	·380	4·2	2·8	60·0	...	7·25	10·25	4·50	7·00	0·00	...	...	4·5	5·0	2	0·05	...
54·4	·424	4·6	2·7	62·8	...	5·25	19·00	5·50	1·25	0·00	...	...	6·1	4·3	3	1·12	...
55·5	·441	4·8	2·8	62·4	...	4·25	18·75	5·75	1·25	0·00	...	...	5·9	3·6	10	6·79	...
57·1	·468	5·1	3·0	63·0	...	9·50	7·50	6·75	7·25	0·00	...	...	5·1	3·7	12	2·38	...
54·9	·433	4·8	1·7	74·1	...	14·75	1·00	0·75	13·50	0·00	...	...	6·4	4·3	17	6·70	...
55·2	·438	4·9	1·7	74·4	...	16·00	1·50	0·00	13·50	0·00	...	...	7·4	4·7	17	6·00	...
53·7	·413	4·6	1·9	70·6	...	23·00	0·00	0·00	8·00	0·00	...	...	6·3	3·6	24	2·35	...
54·5	·427	4·7	1·7	73·4	...	17·25	0·00	0·00	12·75	0·00	...	...	7·2	4·1	25	11·69	...
57·5	·474	5·2	2·1	71·0	...	15·25	1·25	2·00	12·50	0·00	...	...	6·5	4·0	25	12·66	...
55·6	·442	4·8	2·0	71·0	...	13·00	6·75	2·25	8·00	0·00	...	...	5·5	3·4	16	3·61	...
54·8	·431	4·8	1·7	73·6	...	0·50	29·00	1·50	0·00	0·00	...	...	6·2	3·6	20	7·43	...
54·6	·429	4·7	2·2	68·8	...	126·00	117·50	37·50	85·00	0·00	...	...	6·2	4·0	179	63·76	...

Appendix

TRINCOMALEE, CEYLON. Lat. 8° 30′ N.

Month.	Readings of the Barometer.			Temperature of the Air.							Mean Daily Readings of			
							Mean.						Hygrometer.	
	Mean reduced and corrected to 32°.	Highest reduced and corrected to 32°.	Lowest reduced and corrected to 32°.	Highest during Month.	Lowest during Month.	Range during Month.	Of all the highest.	Of all the lowest.	Daily Range.	Approximate Temperature.	Maximum in Sun's rays.	Minimum on Grass.	Dry Bulb.	Wet Bulb.
January	...	...	...	89·0	66·2	22·8	86·3	70·6	15·7	78·4	...	...	80·8	74·9
February	...	...	...	92·6	65·2	27·4	88·8	70·8	18·0	79·8	...	...	83·3	76·4
March	...	...	...	94·8	66·2	28·6	92·5	70·9	21·6	81·7	...	...	85·3	77·6
April	...	...	...	106·8	70·2	36·6	96·4	73·7	22·7	85·0	...	...	87·9	80·3
May	...	...	...	108·4	71·8	36·6	100·7	74·1	26·6	87·4	...	...	88·0	80·9
June	...	...	...	102·2	71·0	31·2	97·8	73·8	24·0	85·8	...	...	89·5	79·4
July	...	...	...	100·8	68·6	32·2	95·9	72·3	23·6	84·1	...	...	87·3	78·1
August	...	...	...	104·6	69·0	35·6	98·9	73·3	25·6	86·1	...	...	88·3	78·8
September	...	...	...	104·6	68·6	36·0	98·4	72·6	25·8	85·5	...	...	89·0	77·6
October...	...	...	...	102·0	68·4	33·6	93·7	71·2	22·5	82·4	...	...	85·2	77·9
November	...	...	...	94·8	66·8	28·0	89·5	70·4	19·1	79·9	...	...	82·6	76·5
December	...	...	...	89·6	65·4	24·2	86·6	70·0	16·6	78·3	...	...	80·8	76·0
Yearly Sums, Means, and Totals ...	...	...	...	99·2	68·1	31·1	93·7	71·9	21·8	82·8	...	...	85·7	77·9

GRAHAM'S TOWN. Lat. 33° 18′ S.

January	28·130	28·379	27·846	104·5	40·7	63·8	91·9	55·4	36·5	73·6	128·3	51·7	72·6	65·7
February	28·141	28·472	27·808	97·0	39·0	58·0	87·8	54·0	33·8	70·9	128·2	50·6	69·4	64·5
March	28·222	28·454	27·831	103·2	43·2	60·0	91·9	54·3	37·6	73·1	118·3	47·5	68·1	61·9
April	28·238	28·734	27·952	90·0	40·0	50·0	86·1	48·9	37·2	67·5	119·4	38·4	64·5	57·9
May	28·258	28·536	28·038	87·2	39·2	48·0	83·9	47·8	36·1	65·8	111·7	34·3	63·0	56·1
June	28·396	28·680	28·211	84·0	35·2	48·8	83·5	43·5	40·0	63·5	106·4	29·9	62·5	54·1
July	28·371	28·723	27·937	94·0	34·0	60·0	85·1	43·3	41·8	64·2	107·0	53·5	58·6	50·7
August	28·334	28·747	27·980	94·5	32·5	62·0	86·9	45·9	41·0	66·4	109·9	37·0	61·7	53·6
September	28·267	28·493	27·893	91·0	40·5	50·5	83·7	49·1	34·6	66·4	111·8	41·4	60·6	56·8
October...	28·271	28·640	27·967	87·5	35·7	51·8	86·0	47·6	38·4	66·8	116·4	41·0	61·1	57·9
November	28·213	28·872	27·920	97·0	41·5	55·5	84·5	51·4	33·1	67·9	127·5	48·2	66·5	60·0
December	28·153	28·366	27·905	107·0	42·3	64·7	92·3	54·5	37·8	73·4	136·9	46·2	72·4	63·9
Yearly Sums, Means, and Totals ...	28·333	28·594	27·941	94·7	38·6	56·1	86·9	49·6	37·3	68·3	118·5	41·2	65·1	58·6

VICTORIA, HONG KONG. Lat. 22° 16′ N.

January	30·071	30·271	29·770	74·0	52·0	22·0	68·6	57·1	11·5	62·8	100·8	52·8	63·6	57·9
February	29·967	30·273	29·724	81·0	53·0	28·0	71·1	59·5	11·6	65·3	108·6	56·4	66·8	61·2
March	29·984	30·133	29·779	84·0	51·0	33·0	69·9	60·3	9·6	65·1	90·3	58·5	64·3	62·3
April	29·919	30·064	29·685	89·0	61·0	28·0	78·6	66·9	11·7	72·7	115·3	65·2	73·6	68·7
May	29·824	30·000	29·891	94·0	68·0	26·0	85·3	73·0	12·3	79·1	127·3	70·3	80·3	71·1
June	29·688	29·939	29·376	96·0	71·0	25·0	88·3	75·6	12·7	81·9	125·5	73·9	82·3	78·2
July	29·672	29·851	29·509	97·5	73·0	24·5	91·5	77·2	14·3	84·3	135·5	74·9	85·4	79·0
August	29·636	29·792	29·419	98·0	73·0	25·0	92·2	77·1	15·1	84·6	127·9	74·4	85·3	79·5
September	29·701	29·901	29·589	96·0	74·0	22·0	91·3	76·0	15·3	83·6	136·8	71·6	84·9	77·7
October...	29·910	30·037	29·782	94·0	65·0	29·0	86·8	72·9	13·9	79·8	123·1	69·6	80·9	73·5
November	30·025	30·354	29·883	85·0	49·0	36·0	78·1	65·3	12·8	71·7	118·8	61·6	73·0	66·5
December	30·117	30·390	29·922	81·0	40·0	41·0	71·9	58·7	13·2	65·3	101·1	54·0	65·8	60·4
Yearly Sums, Means, and Totals ...	29·876	30·084	29·611	89·1	60·8	28·3	81·1	66·8	12·8	74·7	117·6	65·3	75·6	69·7

No. XXVIII—*continued*..

Long. 82° 0′ E. Height above Sea 25 feet.

Hygrometrical Results from Glaisher's Tables.						Atmospherical Conditions.											
		In a Cubic Foot of Air.				Number of Days for mean Direction of Wind.					Calculated from Robinson's Anemometer.					Amount of Rain fall.	
Mean Temperature of Dew Point.	Mean elastic Force of Vapour.	Mean Weight of Vapour.	Mean additional Weight required for Saturation.	Mean Degree of Humidity.	Mean Weight of Cubic Foot of Air.	North.	East.	South.	West.	Number of calm, or nearly calm, Days.	Mean daily pressure of Wind.	Mean daily Horizontal Movement of the Air.	Amount of Cloud 0—10.	Ozone Scale 0—10.	Number of Days on which Rain fell.	On the Ground.	Feet above the Ground.
											lbs. per sq. foot	Miles				Inches	Inches
70·9	·758	8·1	3·1	71·4	...	15·25	15·75	0·00	0·00	0·00	...	...	5·4	3·8	18	10·96	...
71·8	·779	8·3	3·8	68·4	...	13·75	13·50	0·50	1·25	0·00	...	...	3·7	3·2	7	1·59	...
72·8	·802	8·5	4·4	65·5	...	8·25	17·25	4·75	0·75	0·00	...	...	3·6	2·8	4	0·50	...
75·4	·881	9·3	4·7	66·6	...	3·00	21·50	4·50	1·00	0·00	...	...	3·5	1·2	3	0·58	...
76·3	·908	9·4	4·4	68·6	...	2·00	18·25	6·75	4·00	0·00	...	...	4·9	1·5	17	4·65	...
73·0	·813	8·5	6·1	57·7	...	0·75	3·50	14·00	11·75	0·00	...	...	5·7	2·6	8	1·07	...
72·2	·791	8·3	5·4	60·5	...	1·00	7·00	12·25	10·75	0·00	...	...	6·0	2·6	7	3·67	...
72·8	·805	8·4	5·7	59·5	...	0·75	0·75	14·75	14·75	0·00	...	...	5·2	4·3	3	2·28	...
70·4	·740	7·8	6·6	53·8	...	2·00	2·50	12·75	12·75	0·00	...	...	4·3	...	6	3·03	....
73·1	·818	8·6	4·2	67·0	...	8·25	10·00	6·50	6·25	0·00	...	...	6·5	...	27	10·41	...
72·4	·796	8·5	3·8	71·6	...	11·50	12·75	3·00	2·75	0·00	...	...	6·4	...	21	8·60	...
72·7	·806	8·6	2·6	76·8	...	15·25	15·25	0·25	0·25	0·00	...	...	7·3	...	25	30·25	...
72·9	·808	8·5	4·7	65·6	...	81·75	138·00	80·00	66·25	0·00	...	...	5·2	...	146	77·55	...

Long. 26° 28′ E. Height above Sea 1,700 feet.

																	*
60·5	·530	5·7	3·0	65·4	487·8	1·50	10·25	14·25	5·00	0·00	...	274·9	4·5	...	16	0·91	0·42
60·7	·529	5·8	2·0	73·9	490·9	2·75	7·00	13·25	6·00	0·00	...	241·8	5·2	...	14	3·88	2·39
57·0	·466	5·1	2·4	67·2	493·9	2·50	8·00	12·75	7·75	0·00	...	265·2	4·1	...	8	1·58	1·15
52·4	·395	4·4	2·3	64·6	497·8	2·50	3·00	10·75	13·75	0·00	...	252·3	6·6	4·8	11	2·12	1·25
50·3	·363	4·0	2·4	63·4	499·8	2·00	2·00	7·25	19·75	0·00	...	170·2	4·3	4·0	8	0·79	0·28
46·9	·321	3·6	2·7	56·4	503·1	4·75	1·00	3·50	20·75	0·00	...	195·3	2·6	4·0	2	0·03	0·02
43·7	·286	3·2	2·3	57·8	506·9	4·25	2·00	6·50	18·25	0·00	...	224·9	2·8	4·9	5	2·62	2·05
46·6	·318	3·5	2·6	57·6	502·8	3·75	5·50	8·25	13·50	0·00	...	263·4	4·2	4·8	8	3·59	2·73
53·5	·410	4·6	1·3	77·8	502·0	2·50	6·25	9·25	12·00	0·00	...	193·9	6·1	4·8	9	3·36	2·25
55·1	·435	4·8	1·2	81·0	501·5	2·50	9·25	12·50	6·75	0·00	...	251·6	5·9	5·1	16	1·57	0·71
54·7	·428	4·7	2·4	66·0	495·5	2·00	6·50	12·50	9·00	0·00	...	309·4	4·1	4·4	8	1·70	0·86
57·5	·476	5·2	3·4	59·4	488·9	1·75	6·25	13·25	9·75	0·00	...	277·4	3·7	4·1	7	4·12	2·86
53·4	·413	4·5	2·4	65·9	497·6	32·75	67·00	124·00	142·25	0·00	...	243·3	4·4	...	112	26·27	17·07

Long. 114° 9′ E. Height above Sea 43 feet.

																	†
53·2	·405	4·5	2·0	69·1	531·4	12·25	17·25	0·75	0·75	0·00	...	...	4·6	3·8	1	0·57	0·55
56·7	·461	5·1	2·1	70·8	525·7	8·25	18·00	0·75	1·50	0·50	...	...	4·5	3·6	2	0·38	0·36
60·6	·531	5·8	0·8	88·3	528·0	6·25	19·25	3·75	0·75	1·00	...	...	6·8	3·6	12	2·80	2·66
65·1	·621	6·7	2·2	75·1	517·1	6·50	14·50	5·75	1·75	0·50	...	...	5·2	3·6	11	6·65	6·46
64·9	·613	6·6	4·5	58·5	509·2	5·75	14·75	7·75	2·25	0·50	...	...	5·2	3·4	11	9·45	9·24
75·4	·880	9·4	2·4	79·8	503·3	2·50	12·00	10·00	4·00	1·50	...	...	5·8	3·6	21	37·10	36·48
74·8	·866	9·1	3·8	70·4	200·5	2·50	8·00	13·00	7·00	0·50	...	...	3·5	3·2	9	7·11	6·98
75·7	·892	9·4	3·5	72·8	499·7	1·75	11·00	10·75	6·50	1·00	...	...	4·7	3·4	16	14·79	14·29
73·0	·814	8·6	4·1	67·2	501·7	5·50	14·75	5·00	1·75	3·00	...	...	2·9	3·2	12	8·37	8·25
68·5	·697	7·4	3·8	65·4	509·6	7·75	20·25	2·50	0·00	0·50	...	...	3·5	3·4	7	9·31	9·18
61·7	·551	6·0	2·8	68·0	520·1	6·75	22·25	1·00	0·00	0·00	...	...	3·2	3·4	8	1·38	1·30
55·6	·443	4·9	2·2	68·8	528·9	5·75	21·75	1·00	0·00	0·50	...	...	3·4	3·3	3	1·02	0·97
65·4	·648	7·0	2·8	71·2	514·6	71·50	196·75	62·00	26·25	9·50	...	...	4·4	3·5	113	98·93	96·72

* 34 feet above the ground.

† 23 feet above the ground

Appendix

AUCKLAND, NEW ZEALAND. Lat. 36° 50′ S.

Month.	Readings of the Barometer.*			Temperature of the Air.							Mean Daily Readings of			
	Mean reduced and corrected to 32°.	Highest reduced and corrected to 32°.	Lowest reduced and corrected to 32°.	Highest during Month.	Lowest during Month.	Range during Month.	Mean. Of all the highest.	Mean. Of all the lowest.	Mean. Daily Range.	Mean. Approximate Temperature.	Maximum in Sun's rays.	Minimum on grass.	Hygrometer. Dry Bulb.	Hygrometer. Wet Bulb.
January	29·880	30·215	29·353	86·5	48·3	38·2	77·2	54·7	22·5	65·9	116·3	52·3	70·3	63·7
February	29·810	30·110	28·926	87·0	45·9	41·1	75·8	53·1	22·7	64·4	112·7	50·3	67·9	61·0
March	29·921	30·228	29·367	80·4	46·2	34·2	73·5	53·3	20·2	63·4	104·9	51·2	67·5	61·9
April	29·905	30·266	29·548	74·0	43·2	30·8	69·0	50·6	18·4	59·8	89·5	48·7	62·6	58·5
May	29·986	30·317	29·435	70·7	38·1	32·6	65·6	46·2	19·4	55·9	73·3	44·4	57·3	53·5
June	29·876	30·315	29·484	67·8	32·0	34·8	62·7	42·5	20·2	52·6	74·5	39·3	55·1	52·4
July	29·888	30·333	29·290	67·0	31·9	35·1	61·9	41·6	20·3	51·7	80·6	37·6	54·1	51·4
August	29·762	30·143	29·184	64·5	32·2	32·3	62·4	40·3	22·1	51·3	84·9	37·7	52·8	49·9
September	29·785	30·222	29·311	73·6	37·8	35·8	65·7	46·7	19·0	56·2	99·0	44·8	60·0	54·6
October	29·860	30·382	29·475	73·4	35·3	38·1	64·4	43·7	20·7	54·0	88·8	42·5	57·1	52·8
November	29·853	30·198	29·333	77·2	40·0	37·2	70·4	48·9	21·5	59·6	106·2	46·3	63·3	57·6
December	29·856	30·206	29·548	84·5	42·0	42·5	73·8	51·6	22·2	62·7	110·7	48·8	67·5	65·5
Yearly Sums, Means, and Totals ...	29·865	39·244	29·354	75·5	39·5	36·0	68·5	47·8	20·7	58·1	95·1	45·1	61·3	56·9

* Barron and Co.

No. XXVIII—*continued.*

Long. 174° 50′ E. Height above Sea 140 feet.

Hygrometrical Results from Glaisher's Tables.						Atmospherical Conditions.											
Mean Temperature of Dew Point.	Mean elastic Force of Vapour.	In a Cubic Foot of Air.			Mean Weight of Cubic Foot of Air.	Number of Days for mean Direction of Wind.				Number of calm, or nearly calm, Days.	Calculated from Robinson's Anemometer.		Amount of Cloud 0—10.	Ozone Scale 0—10.	Number of Days on which Rain fell.	Amount of Rain fall.	
		Mean Weight of Vapour.	Mean additional Weight required for Saturation.	Mean Degree of Humidity.		North.	East.	South.	West.		Mean daily pressure of Wind.	Mean daily Horizontal Movement of the Air.				On the Ground.	22 Feet above the Ground.
											lbs. per sq. foot	Miles				Inches	Inches
58·6	·494	5·4	2·7	66·6	520·6	12·75	2·50	8·00	7·75	0·00	...	...	7·6	1·7	8	1·77	1·61
55·6	·442	4·8	2·6	63·5	522·1	4·50	5·50	5·50	11·50	2·00	...	...	7·0	1·8	14	4·23	2·71
57·5	·474	5·2	2·2	70·0	524·3	4·00	4·00	17·50	4·50	1·00	...	...	6·7	1·7	11	4·31	3·01
55·0	·434	4·8	1·5	76·5	528·9	5·25	0·75	13·75	9·75	0·50	...	...	7·3	1·8	17	4·68	4·00
50·0	·361	4·0	1·2	76·5	536·3	5·25	0·50	14·25	9·00	2·00	...	...	7·3	1·4	15	1·57	1·35
49·8	·358	4·0	0·9	82·9	536·7	1·50	7·00	8·50	8·00	5·00	...	...	5·9	1·8	19	5·84	5·02
48·8	·342	3·9	0·8	81·8	538·0	2·75	1·00	14·50	10·25	2·50	...	...	6·6	3·0	19	5·21	4·15
47·1	·324	3·7	0·9	81·4	537·4	4·75	2·00	16·00	6·25	2·00	...	...	6·5	2·3	21	3·98	3·39
49·8	·359	3·9	1·8	69·0	530·0	6·25	2·50	6·75	15·50	0·00	...	...	7·4	1·9	22	4·22	3·71
48·8	·345	3·8	1·4	73·6	534·5	1·00	9·75	10·75	7·50	1·00	...	...	7·3	2·2	21	7·46	6·18
52·8	·400	4·4	2·0	78·8	527·8	5·00	6·00	6·75	10·75	1·50	...	...	7·6	1·4	14	3·99	3·55
63·9	·595	6·5	0·9	88·0	522·2	7·50	0·50	7·25	14·25	1·50	...	...	6·7	1·3	11	1·56	1·42
53·1	·411	4·5	1·6	75·7	529·9	60·50	42·00	129·50	115·00	19·00	...	...	6·9	1·6	192	48·82	40·10

Appendix

Abstract of Results of Meteorological Observations

Stations with Height above the Sea.	Readings of the Barometer.			Temperature of the Air.							Mean Daily Readings of			
							Mean.						Hygrometer.	
	Mean reduced and corrected to 32°.	Highest reduced and corrected to 32°.	Lowest reduced and corrected to 32°.	Highest during Year.	Lowest during Year.	Range during Year.	Of all the highest.	Of all the lowest.	Daily Range.	Approximate Temperature.	Maximum in Sun's rays.	Minimum on Grass.	Dry Bulb.	Wet Bulb.
Aldershot ... ... 325 feet	29·562	30·015	28·883	93·8	24·0	69·8	60·8	42·7	18·1	51·7	93·0	39·5	54·6	50·2
Canterbury ... 80 ,,	...	...	...	96·5	12·5	84·0	62·6	39·7	22·9	51·1	...	...	56·6	54·2
Chatham ... ... 160 ,,	29·810	30·260	29·133	93·1	19·2	73·9	60·5	41·9	18·6	51·2	88·7	37·4	55·2	50·9
Colchester ... 109 ,,	29·746	30·232	29·046	92·1	22·4	69·7	62·6	41·2	21·4	51·9	90·0	36·9	55·7	51·1
Devonport ... 35 ,,	29·749	30·222	29·089	90·0	19·5	70·5	63·0	42·5	20·5	52·7	99·0	35·0	56·4	52·4
Dover ... ... 325 ,,	...	...	...	89·0	18·5	70·5	58·1	41·6	16·5	49·8	...	...	53·8	50·4
Guernsey ... ... 248 ,,	29·706	30·194	29·185	82·0	25·0	57·0	58·6	42·8	15·8	50·7	91·9	37·8	53·6	50·9
Jersey ... ... 72·5 ,,	...	...	...	92·0	20·0	72·0	65·2	45·9	19·3	55·5	...	...	56·0	53·1
Netley ... ... 47 ,,	29·908	30·350	29·221	88·5	21·0	67·5	61·3	43·4	17·9	52·3	93·1	41·0	55·2	50·8
Parkhurst ... ... 200 ,,	...	...	...	89·0	12·0	77·0	61·4	42·4	19·0	51·9	87·4	33·1	55·9	51·2
Portsmouth ... 20 ,,	29·971	30·430	29·272	89·0	22·2	66·8	61·1	43·8	17·3	52·4	90·3	38·1	55·3	50·6
Preston ... ... 220 ,,	...	...	...	89·0	17·0	72·0	59·2	37·3	21·9	48·2	...	...	55·8	51·6
Sheerness ... 2 feet below	...	...	...	94·0	25·0	69·0	61·6	40·3	21·3	50·9	...	...	55·6	52·0
Shorncliffe ... ... 220 feet	29·808	30·268	29·165	89·0	12·8	76·2	59·9	39·6	20·3	49·7	92·4	38·3	53·6	50·1
Walmer ... ... 14 ,,	...	...	...	85·8	24·8	61·0	61·3	42·5	18·8	51·9	...	...	55·6	51·5
Winchester ... 214 ,,	...	...	...	93·0	19·0	74·0	61·4	39·3	22·1	50·4	...	...	55·1	50·9
Woolwich ... ... 145 ,,	29·613	30·028	29·007	94·2	19·5	74·7	60·9	40·6	20·3	50·8	91·1	40·0	56·1	52·4
Aberdeen ... ... 61 ,,	29·783	30·399	28·920	86·0	21·0	65·0	56·7	40·0	16·7	48·3	...	...	49·4	45·6
Edinburgh ... ... 402 ,,	29·311	29·943	28·463	86·0	25·0	61·0	55·8	41·5	14·3	48·6	77·0	34·5	51·0	47·2

Abstract of Results of Meteorological Observations

Athlone* ... ... 304 feet	...	...	...	82·0	20·0	62·0	58·5	39·0	19·5	48·7	...	...	52·5	49·3
Belfast† ... ... 50 ,,	29·716	30·328	28·910	86·1	27·2	58·9	60·0	42·4	17·6	51·2	82·4	35·3	52·7	48·3
Buttevant‡	...	...	...	95·0	23·0	72·0	68·8	42·6	26·2	55·7	...	...	57·1	53·2
Cork ... ... 257 feet	29·616	30·140	28·956	84·7	20·0	64·7	60·1	39·5	20·6	49·8	88·3	...	54·0	51.2
Curragh Camp ... 450 ,,	29·410	29·935	28·579	86·7	21·0	65·7	57·4	39·9	17·5	48·6	79·3	29·2	51·7	48·4
Dublin ... ... 72 ,,	29·849	30·311	29·050	87·5	25·2	62·3	59·3	43·1	16·1	51·2	95·9	38·7	53·6	55·2
Fermoy ... ... 176 ,,	...	...	...	86·4	18·6	67·8	60·2	42·2	18·0	51·2	...	...	53·5	50·4
Templemore	...	...	...	88·0	19·0	69·0	59·3	39·9	19·4	49·6	94·0	...	52·9	50·1

* Direction of wind, 8 days short in July. † Direction of wind, 1·50 days short in September.
‡ The observations at Buttevant extend over 240·5 days only, from 5th May to 31st December.

Abstract of Results of Meteorological Observations

Gibraltar ... ... 50 feet	30·069	30·297	29·770	88·5	39·0	49·5	71·0	55·3	15·7	63·1	103·7	40·0	65·6	60·8
Malta ... ... 111 ,,	29·875	30·137	29·568	92·4	42·9	49·5	71·1	61·6	9·5	66·3	126·2	57·6	68·2	63·3
*Scutaria ... ... 50 ,,	29·917	30·171	29·610	95·0	21·4	73·6	66·6	48·6	18·0	57·6	107·7	42·6	61·2	55·8

* Direction of wind 43 days not taken.

Abstract of Results of Meteorological Observations

Quebec ... ... 230 feet	29·730	30·211	29·155	97·7	22·0	119·7	49·4	29·1	20·3	39·3	...	...	40·3	36·0
Halifax ... ... 125 ,,	29·727	30·359	29·113	86·6	5·0	91·6	52·8	32·0	19·9	42·9	86·4	32·3	43·9	41·6
St. John's, Newfoundland... ... ... 130 ,,	29·712	30·252	29·005	85·2	14·8	100·0	53·2	27·3	25·9	40·2	...	26·9	41·9	39·6
Barbados ... ... 25 ,,	29·979	30·084	29·899	92·6	62·0	30·6	87·6	72·7	14·9	80·1	141·4	67·2	83·5	75·3
Bermuda ... ... 61 ,,	30·059	30·316	29·749	91·0	43·0	48·0	77·1	62·1	15·0	69·7	135·5	54·7	73·4	67·3
Newcastle, Jamaica, 3,800 ,,	26·311	26·414	26·211	89·0	52·0	37·0	79·2	64·2	15·0	71·7	118·5	...	70·4	65·8
Up Park Camp, Jamaica* ... ... 225 ,,	29·768	29·916	29·649	...	...	...	...	66·7	...	...	...	61·0	84·6	75·9

* The observations with maximum thermometer at Up Park Camp, Jamaica, only extend over six months. They are therefore omitted.

No. XXIX.

taken at Stations in England and Scotland in the year 1868.

Hygrometrical Results from Glaisher's Tables.						Atmospherical Conditions.													
Mean Temperature of Dew Point.	Mean elastic Force of Vapour.	In a Cubic Foot of Air.			Mean Weight of Cubic Foot of Air.	Number of Days for mean Direction of Wind.				Number of calm, or nearly calm, Days.	Calculated from Robinson's Anemometer.		Amount of Cloud 0—10.	Ozone Scale 0—10.	Number of Days on which Rain fell.	Rain fall on the Ground.	Latitude.	Longitude.
		Mean Weight of Vapour.	Mean additional Weight required for Saturation.	Mean Degree of Humidity.		North.	East.	South.	West.		Mean daily pressure of Wind.	Mean daily Horizontal Movement of the Air.						
											lbs. per sq. foot	Miles				Inches	° ′	° ′
46·3	·327	3·6	1·4	74·8	532·1	70·00	64·50	98·50	133·00	0·00	...	291·5	7·2	2·1	149	30·92	51 15 N.	0 45 W.
52·0	·412	4·9	0·9	85·1	...	73·00	72·00	74·00	126·00	21·00	...	...	3·3	3·0	111	23·97	51 17 ,,	1 5 E.
47·0	·335	3·8	1·4	75·1	535·8	49·50	74·75	94·50	135·25	12·00	...	...	6·4	1·8	172	23·47	51 23 ,,	0 32 ,,
47·0	·337	3·8	1·6	73·8	534·2	74·00	68·50	99·75	123·25	0·50	...	192·1	6·9	4·3	125	18·80	50 53 ,,	0 54 ,,
48·8	·354	3·9	1·3	76·7	533·3	70·75	65·50	103·50	115·75	9·50	...	264·7	6·7	4·3	185	39·90	50 17 ,,	4 5 W.
46·3	·343	3·9	1·1	78·5	...	75·25	75·50	90·25	121·50	3·50	...	...	5·4	5·3	164	27·07	51 8 ,,	1 19 E.
48·2	·347	3·9	0·9	82·6	534·5	86·75	91·00	71·00	113·25	4·00	...	416·0	6·6	5·5	181	12·22	49 33 ,,	2 40 W.
50·4	·378	4·2	1·0	82·2	...	71·00	87·25	91·25	99·00	17·50	...	...	5·8	5·4	147	26·38	49 11 ,,	2 0 ,,
46·7	·329	3·7	1·5	74·4	537·6	71·75	49·75	96·00	145·00	3·50	...	241·7	6·7	5·2	149	32·26	50 51 ,,	1 20 ,,
47·0	·333	3·7	1·6	73·2	...	62·00	81·25	90·00	118·75	14·00	...	...	6·2	5·2	134	32·76	50 45 ,,	1 16 ,,
46·2	·224	3·6	1·5	72·4	538·7	64·00	79·50	77·25	138·25	7·00	...	160·6	5·5	2·8	143	28·19	50 45 ,,	1 5 ,,
47·7	·363	3·8	1·4	75·3	...	38·00	48·25	44·25	80·00	3·50	...	...	3·0	1·4	222	37·50	50 45 ,,	2 40 ,,
48·7	·360	4·0	1·3	78·3	...	88·00	69·75	100·00	105·75	2·50	...	...	5·1	3·6	86	...	51 23 ,,	0 49 E.
46·7	·333	3·7	1·1	78·0	537·5	74·50	63·50	87·25	131·75	9·00	...	...	5·3	4·0	133	26·28	51 5 ,,	1 10 ,,
47·6	·347	3·9	1·4	75·0	...	77·50	59·25	107·75	121·00	0·50	...	...	3·8	4·3	112	27·13	51 0 ,,	1 2 ,,
47·2	·336	3·7	1·4	75·8	...	83·50	79·50	104·25	98·75	0·00	...	...	5·2	3·2	154	34·33	51 4 ,,	1 20 W.
48·9	·371	4·1	1·2	77·7	531·3	46·00	36·00	59·75	224·25	0·00	...	153·9	4·7	3·2	128	23·58	51 29 ,,	0 4 E.
41·7	·271	3·1	1·1	75·9	541·1	70·50	39·75	163·00	92·75	0·00	...	176·4	6·2	...	168	28·14	57 9 ,,	2 6 W.
43·4	·291	3·3	1·1	75·8	531·4	80·50	58·50	107·75	117·75	1·50	...	193·6	6·6	1·6	162	26·95	55 57 ,,	3 11 ,,

taken at Stations in Ireland in the Year 1868.

46·1	·322	3·6	1·0	79·4	...	51·50	58·50	123·50	124·50	0·00	...	...	5·9	4·4	143	29·07	53 26 N.	8 0 W.
44·5	·299	3·4	1·3	74·9	536·4	54·00	68·00	95·00	142·00	5·50	...	130·8	6·4	1·8	193	35·51	54 36 ,,	5 57 ,,
50·2	·374	4·1	1·2	78·4	...	56·25	33·75	88·25	62·25	0·00	...	...	4·9	6·5	127	24·70	52 14 ,,	8 40 ,,
48·5	·351	3·9	0·9	82·5	533·4	82·25	78·00	120·25	85·50	0·00	...	195·0	6·4	3·8	164	40·61	51 53 ,,	8 21 ,,
45·2	·309	3·5	1·0	79·6	533·8	58·00	43·25	113·25	131·00	20·50	...	335·8	6·0	4·1	161	32·72	52 8 ,,	4 48 ,,
46·8	·328	3·7	1·1	78·6	538·9	62·50	34·00	99·75	159·25	10·50	...	93·6	6·1	4·1	190	29·43	55 25 ,,	6 20 ,,
47·5	·339	3·8	1·0	80·8	...	54·25	46·00	78·25	107·00	80·50	...	...	5·4	...	198	39·41	52 2 ,,	8 18 ,,
47·5	·337	3·8	0·9	82·7	...	22·50	76·25	88·75	92·50	86·00	...	...	6·8	5·0	216	33 34	52 48 ,,	7 49 ,,

taken at Stations in the Mediterranean in the Year 1868.

57·0	·473	5·2	1·9	74·3	528·7	71·00	140·75	44·25	110·00	0·00	..	...	2·8	3·3	70	26·45	36 6 N.	5 20 W.
59·4	·532	5·8	2·1	74·2	523·6	124·50	80·75	39·00	85·75	36·00	..	110·6	4·8	3·9	108	25·79	30 35 ,,	14 30 E.
51·3	·407	4·4	2·1	70·9	513·3	98·50	92·00	75·25	51·75	5·50	..	222·5	5·4	5·5	127	36·73	41 0 ,,	29 3 ,,

taken at Stations in North America and the West Indies in the Year 1868.

32·9	·246	2·7	1·5	64·7	551·2	72·00	119·00	36·25	138·75	0·00	...	132·1	6·2	1·1	84	25·20	46 48 N.	71 12 W.
36·7	·262	2·9	1·0	73·9	546·5	128·00	46·25	70·25	116·00	5·50	...	251·6	6·6	3·5	133	59·09	44 39 ,,	63 36 ,,
36·2	·240	2·7	0·7	80·4	549·0	70·25	39·75	68·50	172·00	15·50	...	266·8	7·6	...	69	32·48	47 52 ,,	52 42 ,,
69·9	·735	7·8	4·4	63·7	508·1	147·25	198·25	19·25	0·75	0·00	...	207·0	5·1	3·5	158	40·47	13 4 ,,	59 40 ,,
62·8	·588	6·3	2·8	69·8	520·0	69·50	73·09	110·00	83·50	30·50	...	222·1	6·6	3·1	151	55·78	32 22 ,,	64 40 ,,
62·3	·565	6·1	1·9	75·7	457·9	145·50	181·00	37·75	0·25	3·00	...	...	6·0	6·3	170	114·68	18 6 ,,	76 42 ,,
70·2	·741	7·8	4·8	62·3	503·5	55·25	175·00	129·75	6·00	0·00	...	80·2	3·9	4·2	77	50·11	17 59 ,,	76 56 ,,

Appendix

Abstract of Results of Meteorological Observations

Stations with Height above the Sea.	Readings of the Barometer.			Temperature of the Air.							Mean Daily Readings of			
							Mean.						Hygrometer.	
	Mean reduced and corrected to 32°.	Highest reduced and corrected to 32°.	Lowest reduced and corrected to 32°.	Highest during Year.	Lowest during Year.	Range during Year.	Of all the highest.	Of all the lowest.	Daily Range.	Approximate Temperature.	Maximum in Sun's rays.	Minimum on Grass.	Dry Bulb.	Wet Bulb.
Belgaum, ... 2,260 feet	27·331	27·469	27·18	105·1	53·1	52·0	90·5	63·3	27·2	76·9	...	60·8	78·3	69·7
Bombay* ... ... 37·5 ,,	29·836	29·985	29·67	92·4	61·4	31·0	84·6	74·6	10·0	79·6	121·6	72·3	82·2	75·3
Deesa† ... ... 408 ,,	29·516	29·689	29·333	113·1	46·0	67·1	96·3	70·9	25·4	83·6	157·2	65·2	88·0	70·2
Kurracheet ... ... 40 ,,	29·970	30·129	29·766	117·8	45·6	72·2	95·8	74·7	21·1	85·2	119·9	68·3	89·6	79·2
Poona ... ... 1,850 ,,	27·848	27·999	27·684	104·7	57·4	47·3	56·1	70·1	16·0	78·1	137·3	64·7	79·9	68·6

* The observations at Bombay extend only over 306 days, except those of the rain fall which extend over the whole year.
† Observations at Deesa extend over only 325 days.
‡ The observations at Kurrachee extend over only 289 days.

Abstract of Results of Meteorological Observations

Colombo ... ... 18 feet	...	...	...	104·0	68·0	36·0	95·2	73·4	21·8	84·2	...	...	83·9	75·1
Kandy ... ... 1,678 ,,	...	...	...	104·2	52·2	52·0	91·5	64·3	27·2	77·9	...	...	80·9	73·5
Newera Ellia ... 6,200 ,,	...	...	...	88·0	18·9	69·1	74·6	43·3	31·3	58·9	131·3	...	65·4	59·5
Trincomalee ... 25 ,,	...	...	...	108·4	65·2	43·2	93·7	71·9	21·8	82·8	...	...	85·7	77·9

Abstract of Results of Meteorological Observations

Graham's Town ... 1,700 feet	28·333	28·594	27·941	107·0	32·5	74·5	86·9	49·6	37·3	68·3	118·5	41·2	65·1	58·6
Auckland ... ... 140 ,,	29·865	30·244	29·354	87·0	31·9	55·1	68·5	47·8	20·7	58·1	95·1	45·1	61·3	56·9
Hong Kong... ... 43 ,,	29·876	30·084	29·61	98·0	40·0	58·0	81·1	68·3	12·8	74·7	117·6	65·3	75·6	69·7

No. XXIX—*continued.*

taken at Stations in the Bombay Presidency in the Year 1868.

Hygrometrical Results from Glaisher's Tables.						Atmospherical Conditions.												
		In a Cubic Foot of Air.				Number of Days for mean Direction of Wind.					Calculated from Robinson's Anemometer.							
Mean Temperature of Dew Point.	Mean elastic Force of Vapour.	Mean Weight of Vapour.	Mean additional Weight required for Saturation.	Mean Degree of Humidity.	Mean Weight of Cubic Foot of Air.	North.	East.	South.	West.	Number of calm, or nearly calm, Days.	Mean daily pressure of Wind.	Mean daily Horizontal Movement of the Air.	Amount of Cloud 0—10.	Ozone Scale 0—10.	Number of Days on which Rain fell.	Rain fall on the Ground.	Latitude.	Longitude.
											lbs. per sq. foot	Miles				Inches	° ′	° ′
62·0	·567	6·0	4·3	59·5	468·8	30·75	115·75	92·25	126·75	0·50	...	...	4·3	3·5	102	56·44	15 52 N.	74 42 E.
70·0	·762	8·1	3·6	69·0	506·9	60·75	44·50	41·75	154·00	5·00	...	...	4·5	...	107	63·77	18 54 ,,	72 49 ,,
58·9	·519	5·4	8·6	39·1	497·8	46·00	35·00	83·25	151·75	8·50	...	...	2·1	...	24	18·78	24 12 ,,	72 17 ,,
72·6	·818	8·6	6·1	57·6	502·0	14·00	27·25	110·00	137·75	0·00	...	...	5·5	...	15	3·56	24 47 ,,	67 3 ,,
60·9	·546	5·8	5·2	53·8	476·4	95·75	77·50	51·00	141·75	0·00	...	...	3·9	1·6	72	38·14	18 28 ,,	74 10 ,,

taken at Stations in the Island of Ceylon in the Year 1868.

69·3	·721	7·7	4·7	61·9	...	48·25	42·25	159·25	76·25	0·00	...	...	2·0	5·1	71	114·29	6 56 N.	79 49 E.
68·4	·699	7·4	3·9	65·9	...	73·50	73·50	90·25	38·00	0·00	...	...	4·7	3·1	126	63·33	7 18 ,,	80 48 ,,
54·6	·429	4·7	2·2	68·8	...	126·00	117·50	37·50	85·00	0·00	...	...	6·2	4·0	179	63·76	6 48 ,,	80 48 ,,
72·9	·808	8·5	4·7	65·6	...	81·75	138·00	80·00	66·25	0·00	...	...	5·2	...	146	77·55	...	...

taken at Cape of Good Hope, New Zealand, and China in the Year 1868.

53·4	·413	4·5	2·4	65·9	497·6	32·75	67·00	124·00	142·25	0·00	...	243·3	4·4	...	112	26·27	33 18 S.	26 28E.
53·1	·411	4·5	1·6	75·7	529·9	60·50	42·00	129·50	115·00	19·00	...	...	6·9	1·6	192	48·82	30 50 ,,	174 50 ,,
65·4	·648	7·0	2·8	71·2	514·6	71·50	196·75	62·00	26·25	9·50	...	...	4·4	3·5	118	98·93	22 16 N.	114 9 ,,

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